

<i>Issue Date</i>	<i>Org. Code</i>	NATIONAL WEATHER SERVICE	<i>Program</i>	<i>Part</i>	<i>Section</i>
	W/OSO321	Engineering Handbook	EHB-11	02	3.6

MODIFICATION INDEX - AUTOMATED SURFACE OBSERVING SYSTEM

<u>Number</u>	<u>Date of Issue</u>	<u>T i t l e</u>
1	Delete	Automated Surface Observing System (ASOS) Software Version 1.8
2	March 10, 1993	Liquid Precipitation Accumulation Sensor Cutoff Thermostat Installation
3	March 16, 1993	Installation of External Threshold Detector Power Supply for Setra Model 470
	May 26, 1993	Errata Sheet No.1 Errata to ASOS Modification Note 3 dated April 16, 1993
4	November 9, 1994	Replacement Battery Box Lid for DCP
5	April 30, 1993	Firmware Upgrade for Light Emitting Diode Weather Indicator (LEDWI)
6	June 25, 1993	Replacement Data Collection Platform (DCP) Circuit Breaker for the Ceilometer
7	Delete	Automated Surface Observing System (ASOS) software version 2.0
8	September 22, 1993	Wind Sensor Assembly Upgrades
9	September 23, 1993	Temperature/Dewpoint Electronics Enclosure and Aspirator Assembly Replacement
10	Delete	Automated Surface Observing System (ASOS) Software Version 2.1
10	Delete	Addendum to ASOS Modification Note 10
11	Delete	Automated Surface Observing System Freezing Rain Sensor

Issue Date	Org. Code	NATIONAL WEATHER SERVICE	<i>Program</i>	<i>Part</i>	<i>Section</i>
	W/OSO321	Engineering Handbook	EHB-11	02	3.6

MODIFICATION INDEX - AUTOMATED SURFACE OBSERVING SYSTEM

<u>Number</u>	<u>Date of Issue</u>	<u>Title</u>
12	March 15, 1994	Installation of the 9600-baud modem(s) Model V.3225
12	May 17, 1994	ASOS Errata Sheet 1 Replacement page ASOS Modification for Note 12
12	July 7, 1994	ASOS Errata Sheet 2 Replacement page ASOS Modification for Note 12
13	June 9, 1994	Replacing EPROM on visibility processor and installing visibility crossarm cable guides
13	Errata 1 February 2, 1995	Additional Information to Modification Note 13 dated June 9, 1994
14	June 9, 1994	Software Version 2.0 for Voice Processor board 1A2A20
15	June 10, 1994	Installation off Port Sharing Device Memory Board
15	May 24, 1994	Errata to ASOS Modification Note 15
15	June 16, 1995	Errata 2 to ASOS Modification Note 15
16	D e l e t e	Deactivation of Hygrothermometer Autobalance Module
17	May 18, 1994	Deactivation of Hygrothermometer Fan Fail Circuit
18	May 5, 1995	Automated Surface Operating System (ASOS) Spares Kit
18	Errata 1 December 4, 1995	Automated Surface Operating System (ASOS) Spares Kit Maintenance Note 18

<i>Issue Date</i>	<i>Org. Code</i>	NATIONAL WEATHER SERVICE	<i>Program</i>	<i>Part</i>	<i>Section</i>
	W/OSO321	Engineering Handbook	EHB-11	02	3.6

MODIFICATION INDEX - AUTOMATED SURFACE OBSERVING SYSTEM

<u>Number</u>	<u>Date of Issue</u>	<u>Title</u>
19	April 27, 1995	Wind Sensor Assembly Upgrade, Model 2 Transmitters
20	September 11, 1995	ACU Memory Firmware Version 2.2 and ACU CPU Firmware 1.81
21	August 8, 1995	Firmware Upgrade for ASOS Light Emitting Diode Weather Indicator (LEDWI)
21	Errata 1	Additional Information to Modification Note 21 dated August 8, 1995
22	December 30, 1995	Wind Sensor Assembly Upgrade, Firmware Version 3.0
23	Draft Delete	ACU Memory Firmware 2.2B
24	September 1, 1995	Snow Radiation Shield
25	Never Released	
26	On Hold	LEDWI Firmware 3.65
27	June 30, 1995	Reactivation of ASOS Hygrothermometer Autobalance Module
28	December 5, 1995	Installation of Video Display Unit
29	Delete	Installation of 3K Ohm Resistor on Win Sensor
30	On Hold	Software Version 3.0 Voice Processor Board 1 A 2 A 2 0

<i>Issue Date</i>	<i>Org. Code</i>	NATIONAL WEATHER SERVICE	<i>Program</i>	<i>Part</i>	<i>Section</i>
	W/OSO321	Engineering Handbook	EHB-11	02	3.6

MODIFICATION INDEX - AUTOMATED SURFACE OBSERVING SYSTEM

<u>Number</u>	<u>Date of Issue</u>	<u>Title</u>
31	Delete	ACU Memory Firmware Version 2.3 and ACU CPU Firmware 1.81
3 1	Delete	March 18, 1996 Errata to ACU Memory Firmware Version 2.3 and ACU CPU Firmware 1.81 Reference Modification Note 31, EHB-11, Section 3.6
32	February 2, 1996	Software Version 3.0 for Voice Processor Board 1A2A20
33	May 13, 1996	ACU Memory Firmware Version 2.4 and ACU CPU Firmware 1.81
33	Errata 1 June 13, 1996	Errata to ACU Memory Firmware Version 2.4 and ACU CPU Firmware 1.81 Modification Note 33, EHB-11, Section
34	December 26, 1995	Automatic Surface Observing System (ASOS) Freezing Rain Sensor
35	December 12, 1996	Upgrade to the ASOS Heating Tipping Bucket and Wind Skirt
36	Test	Wind Sensor Assembly Upgrade, Firmware Version 4.0
37	February 5, 1997	Installing Visibility Firmware Version 037 and Visibility Crossarm Cable Guides
37	Errata 1 April 1, 1997	Additional Information to Modification Note 37 Dated February 5, 1997
38	September 17, 1997	ACU Memory Firmware Version 2.49 DCP Boot EPROMs Version 1.80

<i>Issue Date</i>	<i>Org. Code</i>	NATIONAL WEATHER SERVICE	<i>Program</i>	<i>Part</i>	<i>Section</i>
	W/OSO321	Engineering Handbook	EHB-11	02	3.6

MODIFICATION INDEX - AUTOMATED SURFACE OBSERVING SYSTEM

<u>Number</u>	<u>Date of Issue</u>	<u>Title</u>
39	Draft	Replacement Thermostat for the ASOS Heating Tipping Bucket
40	October 21, 1996	Interface Connection and VDU Configuration for the Digital Automatic Terminal Information Service (DATIS) and the Systems Atlanta Information Display System (SAIDS)
41	December 12, 1996	Line filter for wind direction assembly
42	Draft	Acquisition Control (ACU) Uninterruptible Power Supply (UPS) replacement or new installation
43	Draft	Data Collection Platform (DCP) Uninterruptible Power Supply (UPS) replacement
44	Draft	Automated Surface Observing System (ASOS) Thunderstorm Sensor
45	June 20, 1997	Connection of the Automated Surface Observing System (ASOS) to the Federal Aviation Administration (FAA) communication network using codex modems

<i>Issue Date</i>	<i>Org. Code</i>	NATIONAL WEATHER SERVICE	<i>Program</i>	<i>Part</i>	<i>Section</i>
	W/OSO321	Engineering Handbook	EHB-11	02	3.6

MODIFICATION INDEX - AUTOMATED SURFACE OBSERVING SYSTEM

<u>Number</u>	<u>Date of Issue</u>	<u>Title</u>
47	Draft	Installing Visibility Firmware Version 038 and Visibility Crossarm Cable Guides
48	Draft	Installing Visibility Firmware Version 039

For Mods 49 and up, see <http://www.ops1.nws.noaa.gov/asos/Mods.htm>

ASOS MODIFICATION NOTE 1 (for Electronics Technicians)
Engineering Division
W/OSO321:BGM

SUBJECT : Automated Surface Observing System (ASOS) Software
Version 1.8

PURPOSE : To add maintenance capability and operational
enhancements for the ASOS.

EQUIPMENT AFFECTED: ASOS

PARTS REQUIRED : Microcircuit P/N 62828-45000-1
Microcircuit P/N 62828-45001-1
Microcircuit P/N 62828-45002-1
Microcircuit P/N 62828-45003-1
Microcircuit P/N 62828-45004-1
Microcircuit P/N 62828-45005-1

MOD PROCUREMENT : The above parts will be provided by the contractor,
AA1 Systems Management, Inc., as an ASOS Field
Modification Kit (FMK).

SPECIAL TOOLS : IC insertion tool
REQUIRED Small flat-tipped screwdriver
Conductive foam
Electrostatic Discharge (ESD) straps

TIME REQUIRED : 1 hour

EFFECT ON OTHER : None.
INSTRUCTIONS

CERTIFICATION : This modification was successfully tested for
STATEMENT operational integrity in the Engineering Design Branch
laboratory.

General

This modification note provides two procedures to upgrade the ASOS software by removing and replacing erasable programmable read only memory (EPROM). This note provides a procedure for "Before Installing Firmware" and "After Installing Firmware." Technician information on changes and fixes implemented in ASOS software version 1.8 are also provided in this note.

Procedure

Follow installation instructions for "Field Modification Kit (FMK) - #31 and #15A ASOS Software Upgrade" provided by AAI Systems Management, Inc.

EHB-11
Issuance 93-3
2-23-93

Caution: Be careful to protect the electronics on the ACU memory and CPU boards during this procedure. Do not reconfigure any jumpers on the ACU memory or the ACU CPU boards unless instructed to by the procedure.

Before and After Installation Procedures

Procedures Related to Installation of ASOS Firmware Version 1.8

BEFORE INSTALLING FIRMWARE

1. Call the AOMC at 1-800-242-8194. Inform the person who answers the phone at which office you will be installing new firmware.
2. Get approval of the site MIC/OIC before starting installation. You may install on any day of the month if permission is granted and the restrictions in steps 3 and 4 are complied with.
3. **Commissioned Sites Only:** Do not start installation during ^{Severe} bad weather: while precipitation is falling, during instrument flight rule (IFR) conditions, or if either is expected within 3 hours.
4. Do not start firmware installation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Although about 45 minutes should be sufficient, allow 1 hour to complete installation and restart ASOS.
5. In the last observation before starting installation, add the remark "LAST OFFICIAL OBSERVATION."
6. Immediately before beginning work, MIC/OIC/Observer will inform the tower and any other critical users that ASOS will be shut off for firmware upgrade. He/she will alert towers using Controller Video Displays (CVD) and Operator Interface Devices (OID) to log off and shut down display power to avoid confusion.
7. Do not begin the installation process, i.e., halt ASOS, until immediately after an hourly observation has been transmitted.

AFTER INSTALLING THE FIRMWARE

8. When ASOS is restarted, inform towers using CVDs and OIDs to turn on their displays.
9. IF MANUAL BACKUP IS AVAILABLE, office staff must implement manual full backup observation procedures if installation runs past the regular

hourly observation time or if a special must be generated. No special observation is needed when ASOS is restarted. Proceed to step 10.

IF THERE IS NO BACKUP ON SITE and a record observation was missed during the installation, a special observation must be taken when ASOS is restarted. The el tech should take the following steps at the ASOS keyboard after installation:

- a. Press [SIGN].
 - b. Type his/her initials and press [RETURN].
 - c. Type the observer level password and press [RETURN].
 - d. Press [GENOB].
 - e. Press [SPECL].
 - f. Press [EXIT].
 - g. Press [SIGN].
 - h. Type his/her initials again and press [RETURN].
 - i. Press [RETURN] twice. This signs the "observer" off ASOS.
 - j. Leave ASOS running.
10. Inform office staff that ASOS is again operational and that, because at most 15 minutes remain until the next hourly observation, augmentation of the ceiling might be required. It might also be necessary to augment several elements or even enter manually an entire observation. The chart below indicates how long it takes after start up for ASOS to report each observation element automatically.

Minimum Times Needed for Elements to be Reported Automatically

Pressure	50 seconds
Precipitation Amount	60 seconds
Wind direction	90 seconds
Wind speed	90 seconds
Precipitation Type	2 minutes
Temperature	4 minutes
Dew Point	4 minutes
Visibility	8 minutes
Obstruction to Visibility	8 minutes
Ceiling	30 minutes

If report processing is off when the system is shut down (as with a failed sensor), when the system comes back up all report processing will be on. If the sensor is still failed, report processing will need to be turned off.

11. Verify that ASOS transmitted an hourly observation. Call the AOMC at 1-800-242-8194 and tell the operator:
- a. Your location,
 - b. That installation of the new firmware has been completed, and
 - c. That ASOS is operational.

Technician Information

The following paragraphs provide information on the additional maintenance capabilities and enhancements in ACU version 1.8 software. Enhancements include a modified SIO and modem test, tipping bucket data quality, and maintenance action pages.

The SIO and modem tests have been modified to reduce the number of loopback errors associated with each device.

Version 1.7 tests the loopback and xmit capability. Three consecutive failures must occur before posting the failure on the maintenance page with a single fault count. When manually testing SIO cards or modems by pressing the test key, only one test is performed. If the test passes, "P" is returned to the maintenance page. If the device fails on the first pass, additional tests will be performed until the unit passes once or three consecutive failures occur.

In version 1.8 SIO cards and modems must fail three consecutive tests five times within a 24-hour period. This causes a degraded mode and generates the maintenance flag. The past 24-hour data for the modem and SIO are summarized in the SYSLOG at 6:00 local time. A typical message is: MODEM FAILS FOR PAST 24 HOURS: #1=1. The message identifies modem XI having one fault count during the last 24 hours. The fault counts for the SIO boards and modems are cleared from the maintenance pages every 24 hours. There still is a small bug in this firmware with clearing the degraded mode errors at the lowest SIO screen. The clear button does not clear the errors. The work around is to back up to the next higher screen and use this level clear key. The lower level screen will then be cleared.

Version 1.8 also reports degraded radio communication errors in the SYSLOG at 6:00 local time.

The new maintenance reporting pages provide the technician a semi automatic method of logging and reporting different types of maintenance activities. Five new keys have been added under the maintenance page. Maintenance ACTION key calls up a sub-screen that displays PREventive maintenance key, CALibration key, CORrective maintenance key, Field Modification Kit key, and a START key.

The ACT key simply provides access to a lower level maintenance screen.

The START key should be used by the technician when any maintenance activity is conducted. Such activities include calibration, preventive and corrective maintenance, field modifications, and remote testing. When the START key has been activated the SYSLOG will have the message "MT9999 MAINTENANCE ACTION" entered into the log. Any errors that are generated after the START key has been activated will still generate the maintenance flag appended to the SA0. However, the maintenance action stamp in the SYSLOG provides an automatic method of counting only true system errors. Once the technician has activated the START key any maintenance can be conducted. This key does not restrict the

technician's access or activities and has no software checking. This key is strictly for record keeping of system performance.

After completing maintenance activities, the technician should activate maintenance action keys describing the work performed. Four categories, PREVenTive maintenance, CORRective maintenance, CALibration, and Field Modification Kit, are available to describe the technician's work.

Use the PREVenTive maintenance key when any preventive maintenance has been completed, such as cleaning lenses, cutting grass, or painting. When the technician selects the preventive maintenance key, two fields are displayed on the OI.D. The first field is labeled "ENTER ASN". For convenience enter one or several of the following: ACU, DCP, WIND, CHI, VIS, TEMP, T/B, LEDWI, ZR, ALL. The second field is labeled "ENTER SERIAL #". This field is optional; no data are required. A third field appears after data have been entered in the first two fields. This is an operator confirmation of the data that have been entered. If the data are correct, enter "Y" and return.

Use the CALibration key when calibration or calibration verification has been completed. When the technician selects the calibration key, two fields are displayed on the OI.D. The first field is labeled "ENTER ASN". This information is important. Enter each top assembly ASN, as in the following:

- 2A8MT - Wind Sensor;
- 2MT1 - DCP #1 Ceilometer;
- 2MT2 - DCP #1 Present Weather Sensor;
- 2MT3 - DCP #1 Freezing Rain Sensor;
- 2MT4 - DCP #1 1088 or HO83;
- 2MT5 - DCP #1 Visibility Sensor;
- 2MT6 - DCP #1 Rain Gauge;
- 3MT1 - DCP #2 Ceilometer;
- 4MT1 - DCP #3 Ceilometer; etc.

More than one sensor may be entered in the first field, but each sensor calibrated needs to be entered.

The second field is labeled "ENTER SERIAL #". This field is required. Each serial number must be entered in the same order that the sensors were entered in the first field. A third field appears after the data have been entered in the first two fields. This is an operator confirmation of the data that have been entered. If the data are correct, enter "Y" and return.

Use the Field Modification Kit (FMK) key when a field mod kit has been installed. When the technician selects the FMK key, one field is displayed on the OI.D. This field is labeled "KIT #". This information is important for configuration control. Enter the number from the FMK sheet. A second field then appears. This is an operator confirmation of the data that have been entered. If the data are correct, enter "Y" and return. One entry is needed for each FMK installed.

Use the CORRective maintenance key when an FRU has been replaced. When the technician selects the CORRective maintenance key, two fields are displayed on the OI.D. The first field is labeled "ASN". This information is important for configuration control and will help in evaluating high failure items. Enter the Agency Stock Number for each FRU replaced. The second field is labeled "ENTER SERIAL #". This field is required. Each serial number must be entered in the same order that the ASNs were entered in the first field. A third field appears after the data have been entered in the first two fields. This is an operator confirmation of the data that have been entered. If the data are correct, enter "Y" and return.

The ABORT key functions the same as any other ABORT key. When executed, the information entered is discarded and the operator is returned to the 1-minute screen.

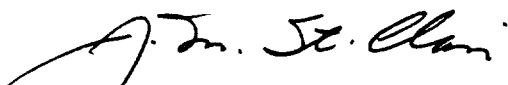
The BACK key functions the same as any other BACK key. When executed, the operator is moved up one level in the screen hierarchy.

The EXIT key functions the same as any other EXIT key. When executed, the operator is returned to the 1-minute screen.

If you have any problems or questions, contact the ASOS Engineer, Al Wissman, through your regional headquarters. Any comments or recommendations about ASOS are also welcome.

Reporting Modification

Target date for completion of this modification is 30 days after receipt of parts. Report completed modification on WS Form H-28, Engineering Progress Report, according to instructions in EHB-4, part 2, using reporting code ASOS.



J. Michael St. Clair
Chief, Engineering Division

Attachments

Time Required to Reboot ASOS and Sensor Response Time after a New Firmware Load

This appendix explains how the ASOS is affected by the installation of a new firmware load (EPROMs). The installation of new firmware requires a lukewarm boot of the ASOS system. The time required to replace the EPROMs is about 10 minutes and is described in the Field Modification Kit (FMK).

There are three booting processes for ASOS:

1. Cold Boot - occurs when:
 - a. the J-22 battery jumper is removed, or
 - b. the memory board is physically replaced with a new memory board.
 During a cold boot both the 12-hour archive and the site specific data are lost.
2. Lukewarm Boot - occurs when UPS power and system power are turned off (all ASOS displays go blank) and EPROMs are physically replaced memory board. During a lukewarm boot the 12-hour archive data are retained in memory (as long as the J-22 battery jumper is not removed), but the site specific data are lost and must be downloaded from AOMC after booting.
3. Warm Boot - occurs when UPS power and/or system power is removed or lost for a short or extended period of time. The system will warm boot as long as the technician does not remove the EPROMs or J-22 battery jumper. During a warm boot both the 12-hour archive and the site specific data are retained.

Once system power is restored ASOS boots automatically. The person installing the EPROMs must log onto ASOS as a TECHNICIAN, and provide ASOS Site ID and AOMC phone number for downloading site specific data from AOMC. Occasionally the AOMC may be temporarily busy or non-operational. If this occurs the time required to download site specific data from the AOMC will increase. Information about the sensor configuration will be unavailable until the AOMC is contacted and the site data are downloaded. However, this rarely occurs. In most situations the AOMC site specific data are downloaded within 10 minutes of the request for download.

The DCP software must also be reset when a new firmware load is installed. This procedure takes about 10 minutes for each DCP. If there is no change to the DCP firmware for a new firmware load (i.e., ACU firmware change only), the DCP does not have to be reset. If the DCP is not reset, the time for recovery is 10, 20, or 30 minutes less, depending on the number of DCPs installed. However, it is highly recommended that the DCPs be rebooted with all firmware changes.

Total installation time (physical installation of EPROMs and DCP boot time) is approximately 20 minutes for a one-DCP system, 30 minutes for a two-DCP system, or 40 minutes for a three-DCP system.

After all DCPs are reset, the system will respond in the following manner. Generally, 75 percent of the data must be available for a sensor to report on the 1-minute screen. The time required for data to be reported on the 1-minute screen (OID) for each sensor follows:

- Pressure - will be restored in 50 seconds (five of six 10-second obs in 1 minute)
- Temperature/Dew Point - four of five 1-minute obs in last 5 minutes - 4 minutes
- Wind speed/direction - needs 18 of 24 5-second average values in 2 minute average - 1 1/2 minutes.
- Visibility - at least eight 1-minute values in last 10 minutes - 8 minutes
- Ceilometer - at least 30 minutes
- Present Weather -
LEDWI (Precipitation Identification) - indicates precipitation if two or more samples indicate precipitation. If three or more samples are missing within a 10-minute period, the sensor is marked missing. - 1 minute (no precipitation occurring), 2 minutes (precipitation).

Freezing Rain Sensor - 1 minute

Obstructions to Vision - uses output from visibility sensor and temperature/dew point sensor - 8 minutes

- Precipitation Accumulation (Tipping Bucket) - Updates 15-minute precipitation amount (PCPN) and 15-minute SHEF once each minute - 1 minute.

The SAO is generated at hourly reporting time or at the time of the next special. Thus, the SAO display on the 1-minute screen remains blank until the next hourly report time or the next special time for the SAO. The SHEF updates and reports within 15 minutes (if precipitation is occurring).

All the ASOS peripheral devices remain blank for a short time upon booting (approximately 30 seconds). The following list briefly describes how the CVD, VDU, Airline Display, and Voice respond to a lukewarm boot (installation of EPROMs) after initial blank display:

CVD -Immediately displays the site ID in the upper left corner after booting, "M/M" for 5-sec magnetic wind speed/direction, and "M" for altimeter. The altimeter appears after 50 seconds, and the 5-second

magnetic wind appears after 1-1/2 minutes. The SAO and density altitude (DA) appear at the hourly reporting time, which can be up to 1 hour after booting, depending on what time during the hour the boot is performed.

VDU - Responds in the same manner as the OI D.

Airline Display - Responds in the same manner as the OI D.

Radio Voice - Initially does not report anything until system is booted. Then the Site ID and message "temporarily inoperative" are heard on the radio voice. As each sensor starts to report, the "missing" message is replaced with the current sensor observation.

Voice (phone) - Initially is busy as long as the system power is removed. Once the booting procedure starts, the voice responds with Site ID and message "temporarily inoperative" until the various sensors begin to report to the 1-minute screen of the OI D as described above. As the sensors begin to report, the voice message changes from "missing" to the current sensor report. There may be a delay of up to 1 minute from the time the sensor reports to the 1-minute screen until the voice reports, depending on when in the minute cycle the sensor reports.

In summary, the time required for complete recovery of all data is approximately:

- 50 minutes (one DCP)
- 60 minutes (two DCPs)
- 70 minutes (three DCPs).

ASOS MODIFICATION NOTE 2 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM

SUBJECT : Liquid Precipitation Accumulation Sensor Cutoff
Thermostat Installation

PURPOSE : Change thermostat to cut off heater power on the
liquid precipitation accumulation sensor.

EQUIPMENT AFFECTED: ASOS Liquid Precipitation Accumulation Sensor

PARTS REQUIRED : Thermostat P/N 3100-302-4, complete with foam
insulator, self-adhesive tape and wire lugs.

MOD PROCUREMENT : The above parts will be provided by the contractor,
AAI Systems Management, Inc., as ASOS Field
Modification Kit (FMK) #033.

SPECIAL TOOLS
REQUIRED : None

TIME REQUIRED : 1 hour

EFFECT ON OTHER
INSTRUCTIONS : None.

CERTIFICATION
STATEMENT : This modification was not tested for operational
integrity.

GENERAL

This modification note provides instructions for removing and replacing the 0 to 20 degree F thermostat with a -20 to +20 degree F thermostat. The thermostat is located on the sensor bottom plate (A2A2) and removes power from the heaters to conserve energy under conditions when precipitation would not normally occur.

PROCEDURE


Follow installation instructions for ASOS Field Modification Kit (FMK) #033 provided by AAI Systems Management, Inc.

WARNING

Disconnect all power to the liquid precipitation accumulation sensor before installing the thermostat.

REPORTING MODIFICATION

Target date for completing this modification is 30 days after receipt of parts. Report completed modification on WS Form H-28, Engineering Progress Report, according to instructions in EHB-4, part 2, using reporting code ASOS.

A handwritten signature in black ink, reading "J. Michael St. Clair". The signature is written in a cursive, flowing style.

J. Michael St. Clair
Chief, Engineering Division

Attachment

SID _____

FMK #033

ASOS FIELD MOD KIT (FMK)

CONTRACT 50-SANW-1-00050

UPON COMPLETION OF MOD, COMPLETE LOWER SECTION
OF THIS SHEET AND RETURN TO:

AAI SYSTEMS MANAGEMENT INC.
11101 GILROY ROAD
HUNT VALLEY, MD. 21030-1108

NOTE: MAKE A COPY FOR ON-SITE RECORDS

Date Prepared: 02/05/93

Task Order/ECP E92SM0F019

Part Numbers Affected: 62828-90116

LIQUID PRECIPITATION SENSOR

Documentation Included: Cutoff Thermostat Installation Procedure

Description of Change:

This FMK provides instruction for the installation of an additional thermostat to cut off power to the heaters at low temperatures.

Parts Included: Thermostat P/N 3100-302-4 (complete with foam insulator, self adhesive tape, and wire lugs)

QA Concurrence with FMK: _____

=====

Date Modification Complete: _____

Part Removed Serial # _____

Part Installed Serial # _____

Person Completing Modification: _____

QA Approval of Modification: _____

Appendix A

Installation Procedure for Thermostat P/N 3100-302-4

1. DISCONNECT ALL POWER FROM THE LIQUID PRECIPITATION SENSOR. AT THE DCP CABINET TURN THE CIRCUIT BREAKER LABELED "A5 TB" TO THE "OFF" POSITION.
2. Remove the sensor base plate.
3. Disconnect and remove the old thermostat, P/N 3100-302-1.
4. Clean all insulation and existing cement from the area around the mounting hole.
5. Connect the new thermostat wires to the terminal block (locations 1 & 4).
6. Remove paper from the insulation and mount thermostat on base.
7. Reassemble the sensor and reconnect power via circuit breaker "A5".

CHANGES AND FIXES

This appendix summarizes the modifications (additions) and fixes to deficiencies in the operational ASOS code implemented in Version 1.80 operational ASOS firmware. The modifications and fixes implemented are briefly described below.

MODIFICATIONS:

TREND MODIFICATIONS - Changed criteria for reporting hard fail communications. Changed ACU/DCP fail count to reset at 0600 LST (instead of midnight LST), added "D" for "degraded mode" to maintenance software.

MAINTENANCE ACTIVITY FUNCTIONS - Added functions for on-site maintenance tracking. ACT, FMK, CORR, CAL, START, ABORT, and PRINT keys added to perform various maintenance functions.

1088 CALIBRATION DATA - 1088 maintenance screen should display results of "T2" test.

SEASONAL TEMPERATURE COMPUTATION - Changed time to perform seasonal temperature calculations from daily to monthly.

STATION I.D. FIELD 3-5 CHARACTERS - Changed length of station I.D. field to a maximum of 5 characters.

MONTHLY TEMPERATURE NORMALS - Are now initialized to the nearest tenth of a degree instead of whole degrees.

FIXES:

INCONSISTENT H083 STATUS REPORTING - H083 sensor turned off, but the maintenance screen displayed power status as pass "P".

SHEF PRODUCT TYPE IDENTIFIERS EDITABLE - SHEF product type identifiers are automatically set. However, the system manager could not manually edit values.

AFOS COMMUNICATIONS FAILURES SOMETIMES NOT IN SYSLOG - SYSLOG indicates AFOS hardware port inoperative and dial out port in use.

INVALID WIND SHIFT SPECIAL - Invalid wind shift noted with wind speed below 10 knots.

PRECIPITATION ACCUMULATION ERRORS - The precipitation accumulation in the PCPN remark and the 6 and 7 group in the SAO did not agree.

INCORRECT AVERAGE WIND SPEED ON DAILY SUMMARY - Average wind speed on daily summary page for the current day should be blank.

TIME DRI FT - ASOS systems in the midwest displayed incorrect time on the system clock when compared to AOMC time.

REMOTE OLD PRINT CAPABILITY - The PRINT key was not displayed on the remote 01D-7. However, if user pushed the location where the print key should have been the PRINT occurred.

SITE PHYSICAL OPENING/CLOSING TIMES - When OPEN 24 Hrs was sequenced to NO and back to YES the edited values should have been restored but were not.

INVALID RADIO ERROR REPORTING - When the primary radio was removed on a two DCP system, incorrect error messages were sent to the system.

1-MINUTE DATA FOR FAILED VISIBILITY SENSOR - The visibility sensor had failed self-test and data quality, yet data were still being reported on the 1-minute current sensor data screen.

MISSING "\$" WHEN TIPPING BUCKET FAILS DATA QUALITY - SAO did not contain a "\$" when the data quality on the tipping bucket sensor failed.

VOICE BOARD SELF-TEST - During quality checking of newly received voice boards, pass conditions occurred when the voice boards were not installed.

SYSLOG FILTER CODE DEFICIENCY - SYSLOG filter function did not extract several failure codes.

TWO SPECIALS GENERATED - When a special was first detected it was immediately being added to the SAO log instead of waiting for the edit time.

AFOS LEASED LINE CONNECTION - NWS added a requirement for AFOS hardware to communicate across leased line connections automatically without having to hook up a modem.

SENSOR POWER LOGIC - Power table referenced unused sensor types.

MODEM STATUS INITIALIZATION - Modem status should be initialized to "*" for the case where no modems are configured.

HELP SCREEN INCORRECT - SAO, SHEF, and 5 MIN help messages did not contain a "-".

INVALID INOPERATIVE SYSLOG MESSAGE - Inoperative SYSLOG messages output for VOICE, UPS, and RVR when they were not configured.

REPETITIVE WIND SENSOR OPERATIONAL MESSAGES - Wind sensor operational messages were being output to the printer once a minute.

LOCAL SENSOR DISPLAY - When the system was cold started the local sensors were not being displayed on the ACU maintenance screen.

MISSING SYNOPTIC MAX/MIN TEMPS IN SAO - Group 1 and 2 min/max temps were not contained in SAO message (edit time=0).

ARCHIVED DATA LOST AT DOWNLOAD - When the system was cold started part of 12-hour archive data was lost.

TEMPERATURE 1-MINUTE DATA - Temperature data were being reported on 1-minute screen even though sensor data quality status had failed.

WIND 1-MINUTE DATA - Wind data were being reported on 1-minute screen even though sensor data quality had failed.

ILLOGICAL CLOUD LAYER FORMATION SPECIAL - The reversal of a cloud layer trend should cause a cancellation of a special just like a reversal of a cloud ceiling trend. It did not occur.

EARLY TRANSMISSION OF CLOUD LAYER SPECIAL - Two specials that were caused by the same parameter (i.e., sky condition) were sent immediately.

ERRONEOUS SHEF HEADERS - The DDHMM field of the SHEF was being filled with the DDHMM from the previous SAO.

VOICE FILE SIZE - The voice file size ran out of space (buffer overflow) and was truncated (for ORD).

MODEMS SHOULD DIAL OUT AT CONFIGURED BAUD RATE - The Alaska sites will only accept 1200 baud phone lines; the code was hard wired for 2400 baud.

INVALID SPECIAL LOGIC - Various special problems associated with FIBIs, early transmission, delay of transmission, and multiple transmission were noticed and fixed.

DAILY HANDLING OF TRACE PRECIPITATION EVENT - When editing DAILY screen a "T" could not be edited into the precipitation field. Also, editing minutes of sunshine to "806" caused the precipitation field to output "*****".

ADAS UTC/LOCAL DATE AND TIME USAGE - ADAS outputs LST date and time instead of UTC date and time.

WIND DATA QUALITY CHECK - Wind speed and direction values outside the range of the sensors caused a warm boot of the system.

REPORT PROCESSING ACCESS OBS/ATC - Observer was unable to manipulate sensor processing on or off with an ATC signed on to ASOS.

ARCHIVE LEDWI C COMMAND DATA - The capability to download raw LEDWI sensor data (12-hour data) using direct command mode from a remote access now exists.

TRUNCATED SKY FIELD WHEN EDITING VARIABLE SKY CONDITIONS - When editing "E8V OVC" the last character was truncated from the 1-minute field.

EDITED VISIBILITY VALUE NOT OUTPUT TO PRINTER - When visibility was edited the old visibility value was output to the printer.

INCORRECT DCP SIO BOARD FAILURE INDICATION - A hardware failure on an SIO card did not result in an error being displayed on the DCP maintenance page.

INCORRECT PRESSURE DIRECTIVES FROM EDITED ALTIMETER - Pressure altitude erroneously calculated for edited altimeter field.

INCORRECT ENDING DATE AND TIME FOR ACCELERATED MODE - The ending date and time did not stop the testing in accelerated mode.

INVALID RADIO TRANSFERS - Additional check sum added to insure that out of range sensor values do not get passed to the system.

NEW LOAD PREPROCESSOR FOR MONTHLY CHANGE - In order to change monthly normals to display monthly data to nearest tenth of a degree, the data had to be stored in floating point format.

FAA ADAS PORT 6 HDLC PROTOCOL ANOMALY - The error only occurs when the GS-200 (ADAS/FAA) requests a retransmission of a frame that contained an error.

FAIL COUNT TOTALS FOR PAST 24 HOURS DON'T APPEAR IN SYSLOG - All fail counts for past 24 hours did not appear in the SYSLOG at 0600 LST.

INCORRECT HANDLING OF SIO ERRORS - Failure counts for past 24 hours were incorrectly totaled in the SYSLOG.

REMOTE OID #8 (DCP) UNABLE TO PROCEED PAST 1-MINUTE SCREEN - When a technician hooked a laptop PC to OID #8 at DCP UPS he was unable to proceed past the 1-minute screen.

ASOS MODIFICATION NOTE 3 (for Electronics Technicians)

Engineering Division

W/OSO321: BGM

SUBJECT : Installation of External Threshold Detector Power Supply for Setra Model 470

PURPOSE : To ensure a proper reset of power to the pressure sensors in the event of an under voltage or power failure.

EQUIPMENT AFFECTED: Class 1 ASOS Pressure Sensors A1 and A2

PARTS REQUIRED : Threshold Detector, P/N 347501 QTY 2
Ty-strap, P/N TY25M QTY 1

MOD PROCUREMENT : The above parts will be provided by the contractor as ASOS Field Modification Kit (FMK) X027.

SPECIAL TOOLS : None.
REQUIRED

TIME REQUIRED : 1 hour.

EFFECT ON OTHER : None.
INSTRUCTIONS

CERTIFICATION : This modification was not tested for operational
STATEMENT integrity.

GENERAL

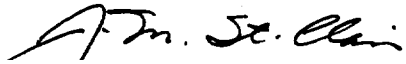
This modification note provides instructions for inserting a threshold detector in series with pressure sensors (A1) and (A2) located on the RF/Pressure Mounting Shelf (A6). The threshold detector is installed in series between P3 to J2 on pressure sensor (A1) and P4 to J2 on pressure sensor (A2). Reference figure 2.4.12 page 2-97 in the ASOS Site Technical Manual S100 for a detailed block diagram. This modification note affects the class 1 ASOSs.

PROCEDURE

Follow installation instructions for ASOS FMK #027 provided by AA1 Systems Management, Inc.

REPORTING MODIFICATION

Target date for completing this modification is 30 days after receipt of parts. Report completed modification on WS Form H-28, Engineering Progress Report, according to instructions in EHB-4, part 2, using reporting code ASOS.

A handwritten signature in black ink, appearing to read "J. Michael St. Clair". The signature is fluid and cursive, with the first letters of each name being capitalized and prominent.

J. Michael St. Clair
Chief, Engineering Division

Attachment

SID _____

FMK 027

ASOS FIELD MOD KIT (FMK)

CONTRACT 50-SANW-1-00050

UPON COMPLETION OF MOD, COMPLETE LOWER SECTION
OF THIS SHEET AND RETURN TO:

AAI SYSTEMS MANAGEMENT INC.
11101 GILROY ROAD
HUNT VALLEY, MD. 21030-1108

NOTE: MAKE A COPY FOR ON-SITE RECORDS

Date Prepared: 09/24/92 Task Order/ECP: E92SM05F040 ECN No: 19316

Part Numbers Affected: 62828-90110-10 SETRA MODEL 470

Documentation Included: SETRA Installation instructions and SMI ECN 19316

Description of Change: This FMK includes parts and instructions to install an external threshold detector on each Pressure Sensor located in the RF/Pressure tray in the ACU cabinet. This change will affect class 1 ASOS systems only.

Parts Included: Threshold Detector P/N 347501 QTY. 2
 Ty-strap P/N TY25M QTY. 1

QA Concurrence With FMK:

Date Modification Complete:

Part Removed Serial #

Part Installed Serial #

Person Completing Modification:

Were FMK Instructions clear/concise: Y / N (circle)

Was FMK complete (parts, drawings, etc.): Y / N (circle)

If NO please comment (use back of form if needed):

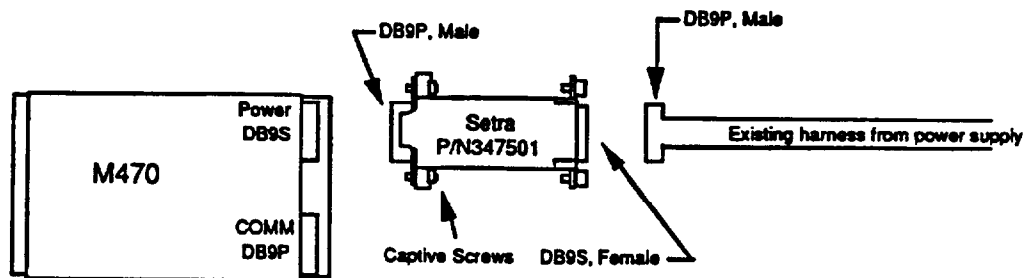
Instructions Installation

1. At the ACU RF/Pressure tray locate the 4-port pressure tubing coupler, and cut the ty-strap securing it in place.
2. Relocate holes for tubing coupler, refer to ECN 19316 (sheet 2) for hole size and location. Re-strap the coupler in the new position.
3. Install the Setra External Threshold Detector (part number 347501) per Setra installation instructions.
4. Secure RF/Pressure tray in the ACU cabinet and verify sensor is operational. (The sensor will resume reporting within 10 minutes.)

Setra Part Number 347501

External Threshold Detector for Setra Model 470

This adapter module is installed in series between the Setra Model 470 and a 5 vdc regulated power supply.



1. Unplug the existing power supply harness from the M470 power connector.
2. Plug the 347501 module into the 470 power connector.
3. Tighten the captive screws on the module into the screw jacks on the M470.
4. Plug the existing power supply harness into the 347501 module.

This module contains a circuit which monitors the voltage level of the power supply. In the event of an under-voltage condition, this circuit shuts off the voltage supply to the 470 and does not turn it back on until the supply exceeds the threshold voltage, in order to ensure proper reset and startup.

45 Nagog Park Acton, Massachusetts 01720

setra

ERRATA SHEET NO. 1 (for Electronics Technicians)

Engineering Division

W/OSO321:BGM

Errata to ASOS Modification Note 3 dated ^{March}~~April~~ 16, 1993**GENERAL**

This errata sheet provides additional installation instruction for a label to be affixed to the Setra pressure sensor.

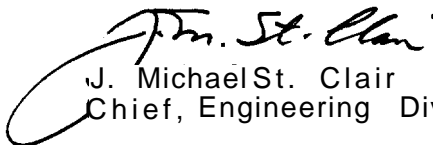
PROCEDURE

Make a pen-ink change to page 1 of the modification note. Add to **PARTS REQUIRED: Label, QTY 2.**

Remove the copy of the Field Mod. Kit (FMK) attached to the modification note and replace it with the copy attached to this sheet.

EFFECT ON OTHER INSTRUCTIONS

None.



J. Michael St. Clair
Chief, Engineering Division

Attachment

SID _____

FMK 027

ASOS FIELD MOD KIT (FMK)

CONTRACT 50-SANW-1-00050

UPON COMPLETION OF MOD, COMPLETE LOWER SECTION
OF THIS SHEET AND RETURN TO:

AAI SYSTEMS MANAGEMENT INC.
11101 GILROY ROAD
HUNT VALLEY, MD. 21030-1108

NOTE: MAKE A COPY FOR ON-SITE RECORDS

Date Prepared: 09/24/92 Task Order/ECP: E92SM05F040 ECN No: 19316

Part Numbers Affected: 62828-90110-10 SETRA MODEL 470

Documentation Included: SETRA Installation instructions and SMI ECN 19316

Description of Change: This FMK includes parts and instructions to install an external threshold detector on each Pressure Sensor located in the RF/Pressure tray in the ACU cabinet. This change will affect class I ASOS systems only.

Parts Included:	Threshold Detector	P/N 347501	QTY. 2
	Ty-strap	P/N TY25M	QTY. 1
	Label	N/A	QTY. 2

QA Concurrence With FMK:

Date Modification Complete:

Part Removed Serial#

Part Installed Serial#

Person Completing Modification:

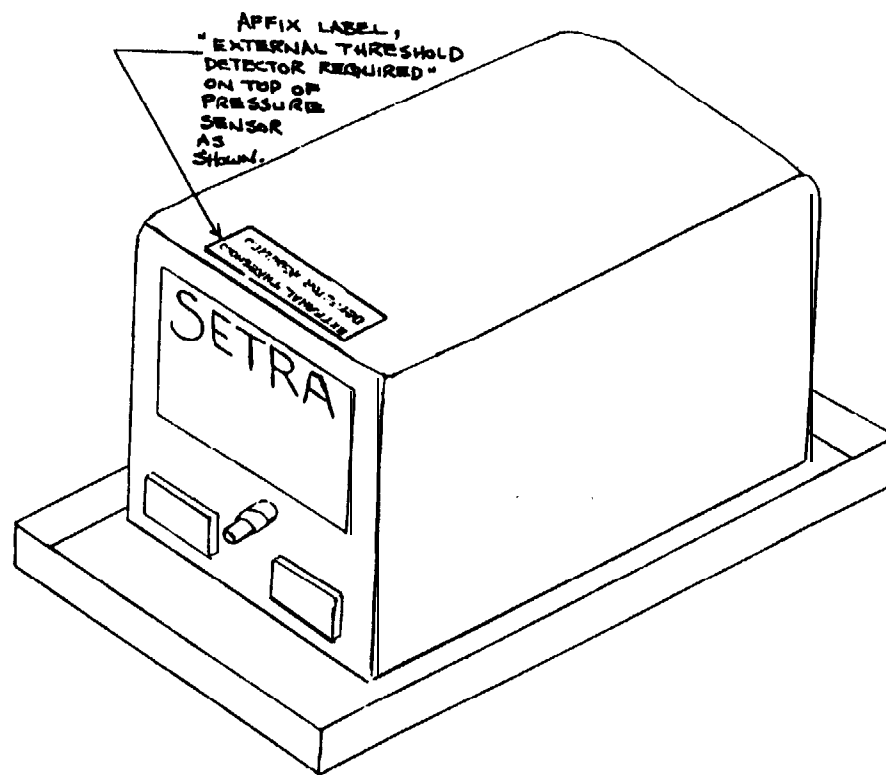
Were FMK Instructions clear/concise: Y / N (circle)

Was FMK complete (parts, drawings, etc.): Y / N (circle)

If NO please comment (use back of form if needed):

Installation Instructions

1. At the ACU RF/Pressure tray, locate the 4-port pressure tubing coupler and cut the ty-strap securing it in place.
2. Relocate holes for tubing coupler. Refer to ECN 19316 (sheet 2) for hole size and location. Restrap the coupler in the new position.
3. Install the Setra external threshold detector (part number 347501) per Setra installation instructions.
4. Secure RF/Pressure tray in the ACU cabinet and verify sensor is operational. (The sensor will resume reporting within 10 minutes.)
5. Affix label "EXTERNAL THRESHOLD DETECTOR REQUIRED" per Figure 1.

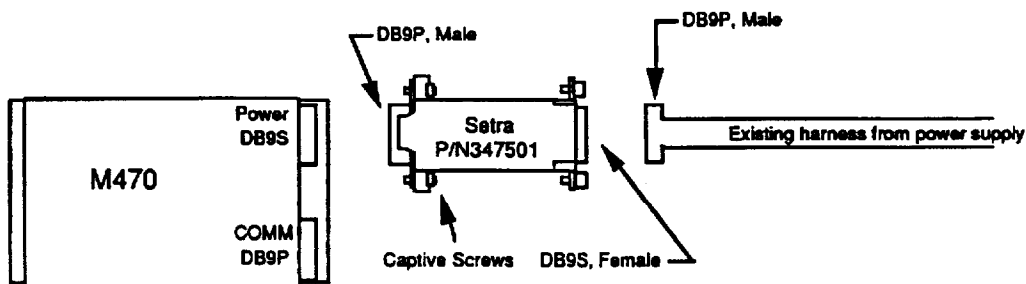


F i g u r e 1

Setra Part Number 347501

External Threshold Detector for Setra Model 470

This adapter module is installed in series between the Setra Model 470 and a 5 vdc regulated power supply.



1. Unplug the existing power supply harness from the M470 power connector.
2. Plug the 347501 module into the 470 power connector.
3. Tighten the captive screws on the module into the screw jacks on the M470.
4. Plug the existing power supply harness into the 347501 module.

This module contains a circuit which monitors the voltage level of the power supply. In the event of an under-voltage condition, this circuit shuts off the voltage supply to the 470 and does not turn it back on until the supply exceeds the threshold voltage, in order to ensure proper reset and startup.

45 Nagog Park Acton, Massachusetts 01720

setra

ASOS MODIFICATION NOTE 4 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM

SUBJECT : Replacement Battery Box Lids for ACU and DCP

PURPOSE : To provide a sealed connector on the ACU and DCP battery box lid to prevent sparks from igniting hydrogen when cables to the battery boxes are disconnected.

EQUIPMENT : Automated Surface Observing System (ASOS)
AFFECTED

PARTS REQUIRED : ACU battery box lid P/N 62828-90031-1LID
Label P/N 62828-40063-10-MOD 1
DCP battery box lid P/N 62828-90031-2LID
Label P/N 62828-40062-10 MOD 1

MOD PROCUREMENT: Order parts from NLSC as ASOS Field Modification Kits ASN S100-FMK028-038 and ASN S100-FMK028-LABEL. There is no charge for these items. ECP: E92SM05F047. See appendix 'A' for specific sites.

SPECIAL TOOLS : None
REQUIRED

TIME REQUIRED : 1.5 hour

EFFECT ON OTHER: None
INSTRUCTIONS

CERTIFICATION : This modification was tested for operational integrity by
STATEMENT the Test & Evaluation Branch at Sterling, VA.

GENERAL

This note provides installation instructions for removing and replacing the ACU and DCP battery box lid assemblies. Caution must be used while replacing the battery box lids. Listed in Appendix A are sites that require both ACU and DCP lid replacements and sites that only require a label be attached to the existing battery box lids.

PROCEDURE

1. Call the AOMC at 1-800-242-8194. Provide the AOMC the SID for the site at which you will be installing the modification. Confirm that AOMC will provide access to the site-specific data base.

2. For commissioned sites, get approval of the responsible MIC/OIC before starting modification. For noncommissioned sites, coordinate with the site MIC/OIC before starting modification. You may modify on any day of the month if permission is granted and the restrictions in steps 3 and 4 are complied with.
3. Commissioned Sites Only: Do not start modification during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of those conditions is expected within 3 hours. These meteorological conditions will be defined by the responsible MIC/OIC.
4. Do not start modification at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Although about 1.5 hours should be sufficient, allow 2 hours to complete the modification and restart ASOS.
5. Immediately before beginning work at NWS staffed sites, the MIC/OIC, observer will inform the tower and any other critical users the ASOS will be shut off for modification installation purposes (at unstaffed sites, the el tech will inform tower). He/She will alert towers using Controller Video Displays (CVD) and Operator Interface Devices (OID) to log off and shut down display power to avoid confusion. At commissioned sites only, download the following data to laptop using the direct command mode: 5-minute data (12 hrs.), and SYSLOG information (24 hrs.), SHEF messages (24 hrs.), and any 2-hour archive files.
6. Do not halt ASOS until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.
7. Make appropriate entries in the SYSLOG using the Maintenance Action keys, Field Modification keys, and comment fields. Follow these steps:

Log on as TECH.

Key the MAINT screen.

Key the ACTION page.

Key the Start key.

Exit; complete the modification.

Log on as TECH once modification has been completed,

Key the MAINT screen.

Key the ACTION page.

Key FMK. Enter the Modification Note number as follows: MOD 4. On the second line of the screen verify that only MOD 4 is displayed. Complete by entering Y in the Y/N if only MOD 4 is displayed.

Check the SYSLOG and verify the FMK message. Notify the AOMC via the telephone that MOD 4 is complete.

A . REPLACING BATTERY BOX LID IN DCP

Tools Required: Medium flat-tipped screwdriver
Two 5/16-inch box wrenches
5/8-inch nut driver
3/8-inch nut driver
No. 2 Phillips screwdriver

WARNING

Death or severe injury may result if power is not removed from DCP before performing maintenance.

1. Coordinate with site observer, if applicable, and make an entry in the SYSLOG.
2. Set OUTPUT POWER switch S1 on UPS status panel to OFF (0) position. OUTPUT indicator on status panel extinguishes.
3. Set primary Circuit Breaker Module A1A3A1 to OFF position.
4. Remove facility power from the DCP equipment cabinet by setting DCP circuit breaker in junction box to off.
5. Loosen hose clamp on battery box vent tube and remove tubing from top of battery box.

WARNING

The battery box is heavy (75 pounds) and should be slid, not lifted. If lifted, two people or mechanical lift is required. Failure to comply may result in injury to personnel or damage to equipment.

6. Slide battery box forward as far as possible so that rear of box rests on front edge of DCP cabinet while box is retained by the attached lanyards on each side.
7. Slide retaining straps off of left and right top of battery box.

CAUTION

When lifting top of battery box, do not pull the attached wires off the connector.

EHB-11
Issuance 94-19
11-9-94

8. Carefully lift top off of battery box and allow battery box to vent with top off for 5 minutes.
9. Disconnect cable from top of battery box by grasping both sides of cable connector between thumb and index finger, applying inward pressure, and pulling connector free.

NOTE: Inspect the connector on the battery box lid from the inside looking out: Look for adhesive in the connector pin cavities and the use of PVC wire. The adhesive must be hard epoxy or hot glue type (RTV is not correct). Modified batteries will be identified with a label including part number and the word "MOD 1." ~~box~~ Lid

If there is no adhesive used in connector cavities go to step 10.
 If there is RTV adhesive used in the connector cavities go to step 10.
 If Teflon wire (feels slick) is used in the connector go to step 10.
 If connector cavities are filled with epoxy and PVC wire is used but labeled with "part number" and "MOD 1" nomenclature is missing, go to step 14 (apply label).

10. Using two 5/16-inch wrenches, remove bolt, flat washers, lock washer and nut from negative terminal of battery BT1 (connected to top of battery box via black wires). Remove black wires from negative terminal.
11. Using two 5/16-inch wrenches, remove bolt, flat washers, lockwasher and nut from positive terminal of battery BT5 (connected to top of battery box via red wires). Remove red wires from positive terminal and remove top of battery-box.
12. Position replacement battery box top to allow connection of red wires to positive terminal of battery BT5 and black wires to negative terminal of BT1.
13. Using markers as a guide and two 5/16-inch box wrenches, install bolts, flat washers, and nuts securing wires to their respective terminals.
14. Install top on battery box and press into place.

Apply label (supplied with this mod. kit) to lid. Apply label looking at lid top view with the connector on right side and the vent on left side. Measure 4 inches from the right edge toward center and 2 inches from the bottom edge toward center. This position should put the label approximately 1.25 inch below connector.

15. Pull two retaining straps over top of battery box to secure top.
16. Using flat-tipped screwdriver, install battery box vent tube.

17. Position cable connector on-top of battery box and press connector into place. Ensure that battery cable connector is fully seated and locked in place.
18. Slide battery back into original position inside DCP.
19. Apply facility power to DCP equipment cabinet by setting DCP circuit breaker in ac junction box to ON position.
20. Set primary Circuit Breaker Module A1A3A1 to ON position.
21. Set OUTPUT POWER switch S1, on UPS status panel to ON (1).
22. Coordinate with site observer, if applicable, and clear any maintenance flags generated, making an entry in the SYSLOG.

B. REPLACING BATTERY BOX LID IN ACU

Tools Required: Two 5/16-inch box wrenches
No. 2 Phillips screwdriver
Small screwdriver

WARNING

Death or severe injury may result if power is not removed from ACU before performing maintenance. Ensure that output power switch is set to 0 (off) and facility power is removed from ACU.

1. Set OUTPUT POWER switch on UPS status panel to 0 (OFF) position. OUTPUT indicator on status panel extinguishes.
2. Remove facility power from ACU.
3. On Battery Box 1A8, disconnect cable connector from battery box connector J1 by squeezing tabs on side of connector inward while rocking the connector free.
4. Wait at least 30 seconds while UPS capacitors discharge through bleeders and other drains. ACU blower 1B1 must be removed to access battery box 1A8.
5. Using small screwdriver, tag and remove three blower AC power wires from AC Power-Distribution Assembly 1A7 terminals 1A7-18D, -19D, and -200 or cut TY-Wraps and remove blower.

NOTE: There are two types of cabinets for the ACU. One type has a partial length front door with the blower mounted behind an air intake grill. The other type of cabinet has a full length door with the blower accessible with the door open.

6. If ACU cabinet has a partial length front door, using Phillips screwdriver, remove six Phillips screws and lockwashers securing air intake grill to lower front of cabinet. Remove air intake grill.
7. If ACU cabinet has a full length front door, open front door. Loosen knurled knobs on each side of shield in front of blower B1 and remove shield.
8. Remove air filter from blower.
9. Using Phillips screwdriver, remove four screws, lockwashers, and flat washers securing blower to ACU cabinet.

10. Remove blower from cabinet.

CAUTION

Pressure sensors in RF/Pressure Mounting Shelf 1A6 are safety-critical devices. Pressure sensors may output erroneous readings if plastic vent tubing to I/O panel assembly is damaged or crimped. Throughout this procedure, exercise caution to avoid damage to pressure vent tubing.

11. Disconnect retaining strap securing battery box 1A8 to inside of ACU cabinet.

WARNING

Battery box is heavy (75 lbs) and should be slid, not lifted. If lifted, two people or mechanical lift is required. Failure to comply may result in injury to personnel or damage to equipment.

12. Slide Battery Box 1A8 from ACU cabinet through blower opening.

CAUTION

When lifting top of battery tray, do not pull the attached wires off the connector.

13. Lift top of battery box and position so that battery terminals can be accessed.

WARNING

Severe injury may result if the negative and positive battery terminals are shorted together. Exercise caution while performing maintenance on batteries.

NOTE: Inspect the connector on the battery box lid from the inside looking out. Look for adhesive filling the connector pin cavities and the use of PVC wire. The adhesive must be hard epoxy or hot glue type (RTV is not correct). Modified batteries will be identified with a label including part number and the words "MOD 1".

Box Lid

If there is no adhesive in connector cavities go to step 14.

If there is RTV adhesive used in the connector cavities go to step 14.
If Teflon wire is used in the connector go to step 14.
If connector cavities are filled with epoxy and PVC wire is used but labeled with "part number" and "MOD 1" nomenclature is missing, go to step 17 (apply label).

14. Using two 5/16-inch box wrenches, remove bolt, flat washers, lockwasher, and nut from negative terminal of battery BT1 (connected to top of battery box via black wires). Remove black wires from negative terminal.
15. Using two 5/16-inch box wrenches, remove bolt, flat washers, lockwasher, and nut from positive terminal of battery BT5 (connected to top of battery box via red wires). Remove red wires from positive terminal.
16. Position replacement battery box top to allow connection of red wires to positive terminal of battery BT5 and black wires to negative terminal of BT1.
17. Using two 5/16-inch box wrenches, install bolt, flat washers, lockwasher, and nut securing wires to respective terminals. Position top over battery box and press into place.

Apply label (supplied with this mod. kit) to lid. Apply label looking at lid top view with the connector on right side and the vent on left side. Measure 4 inches from the right edge toward center and 2 inches from the bottom edge toward center. This position should put the label approximately 1.25 inch below connector.

18. Slide battery box into ACU cabinet through blower opening. While taking care not to damage or crimp pressure sensor vent tubing, position box with connector J1 to right and two rear corners in contact with vertical plates. Secure battery box in position by installing retaining strap to left and right vertical plates.
19. Install blower into ACU cabinet using four screws, flat washers, and lockwashers. Install air filter in blower.
20. Install intake grill or blower shield, depending on which type of cabinet you have.
21. Using small screwdriver and tags as guide, install three blower AC power wires to AC Power Distribution Assembly 1A7 terminals 1A7-18D, -19D, and -200.
22. Position battery plug over connector on the top of battery tray and press into place, ensuring that battery plug is fully seated and locked into place.
23. Apply facility power to ACU cabinet.

23. Apply facility power to ACU cabinet.
24. Set Output power switch to 1 (on) position. Check for proper operation. Verify accuracy of pressure sensor data using portable pressure standard. This procedure can be found in the ASOS Site Technical Manual, table 8.5.2.
25. After the modification has been completed, package the battery box lids for shipment to NRC. Complete and attach a WS Form H-14 for each component returned. Items being returned should include 2 each ASN S100-1A8A1A1 battery box lids for the ACU and DCP.

This completes the modification.

REPORTING MODIFICATION:

Target date for completing this modification is 45 days after receipt of parts. Notify the AOMC before starting the modification. Report completed modification on WS Form A-26, Maintenance Report, per instructions in EHB-4, part 2, using reporting code ACU.



J. Michael St. Clair
Chief, Engineering Division

Attachment

Appendix A

The following list shows the SIDs that require the battery box replacement lid and the SIDs that require only the label.

Replacement battery box lid required (ASOS class II systems installed before 6-10-93.) Each SID requires one battery box lid for the ACU and one battery box lid for the DCP. SIDs marked with a "+" require an additional battery box lid for each additional DCP. (Part required: ASN S100-FMK028-038)

ACT	ACY+1	ADQ	AGS	AKO	ALS	AMA
AST	ATY	ATL+1	BFF	BFM	BGM	BIS
BI X1	BI X2	BI X3	BLU	BTR	CDS	CNK
CNU	COS	CSG	CSM	CYS	DAB	DDC
DHT	DSM	DTW+2	EMP	EWB	FCA	FNT
FOE	FSM	FYV	GAG	GCK	GEG	GLD
GRI	GTF	HBR	HFD	HLC	HLN	HUT
HVN	ICT	ILG	IXD	JAN	JAX	JEF
JKL	KNRS	LAW	LEX	LGB	LHX	LNK
LOZ	LVM	LWS	MCI+1	MCN	MCO+1	MHK
MKE+1	MLC	ML1	OIC	OKC	OLM	PAH
PBI	PHX	PIA	PNC	PUB	PWA	PWM
RFD	RSL	SAV	SCK	SGF	SLN	SMF
SMP	SMX	SNY	SPI	SPS	STJ	SUX
SXT	SYR	TOP	TRI	TUL	TUP	STO

Label only required for the SIDs listed below. (ASOS class II systems installed after 6-10-93 but before 11-15-93.) (Part required: ASN S100-FMK028-LABEL)

ABR	AKN	ALB	ALW	ANC	APN
ARB	AXN	AZO	BFD	BIL	BRO
BTL	BTM	BTT	BWG	BZN	CAK
CDB	CLE	CRW	DET	DVX+1	ELM
ENA	EPH	ERI	FAI	FOK	FSD
FWA	GCN	GGW	GKN	GRB	GRR
HOM	HON	HTL	HVR	IPT	JNU
KNFJ	KNGP+1	KNGW	KNJW	KNOG	KOLA
KOLW	KTN	LAN	LOU	MBS	MCG
MFD	MGW	MIC	MKG	MLS	MPV
MRI +1	MSO	MWH	ORH	DRT	PADK
PAQ	PDT	PIR	PLN	PSC	PTK
SCC	SFF	SIT	STC	STP	TAL
TYS	UCA	STO			

ASOS MODIFICATION NOTE 5 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM

SUBJECT : Firmware Upgrade for Light Emitting Diode Weather Indicator (LEDWI)

PURPOSE : Update firmware on the present weather sensor microprocessor board A1A1A

EQUIPMENT AFFECTED: ASOS Present Weather Sensor

PARTS REQUIRED : EPROM Version 3.61

MOD PROCUREMENT : The above part will be provided by the contractor, AAI Systems Management, Inc., as an ASOS Field Modification Kit (FMK) #002B. ECP: E93SM05F063

SPECIAL TOOLS REQUIRED : None

TIME REQUIRED : 1 hour

EFFECT ON OTHER INSTRUCTIONS : None

CERTIFICATION STATEMENT : This modification was successfully tested for operational integrity at Sterling, Virginia, and Johnstown, Pennsylvania.

GENERAL

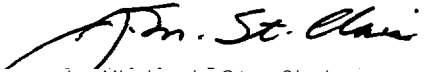
Current production present weather sensors contain version 3.49 firmware. The changes in version 3.61 firmware will help reduce the number of false alarms and false identifications and help with the removal of snow and ice around the transmitter and receiver lenses. The 3.61 firmware allows extended hood heater on time; the heaters will remain on for 5 minutes after beam intensity is reestablished.

PROCEDURE

Follow installation instructions for ASOS FMK #002B provided by AAI Systems Management, Inc.

REPORTING MODIFICATION

Target date for completing this modification is 30 days after receipt of parts. Report completed modifications on WS Form H-28, Engineering Progress Report, according to instructions in EHB-4, part 2, using reporting code ASOS.

A handwritten signature in black ink, reading "J. Michael St. Clair". The signature is fluid and cursive, with the first name "J. Michael" and last name "St. Clair" clearly legible.

J. Michael St. Clair
Chief, Engineering Division

Attachment

SID _____

FMK #002B

ASOS FIELD MOD KIT (FMK)

CONTRACT 50-SANW-1-00050

UPON COMPLETION OF MOD, COMPLETE LOWER SECTION
OF THIS SHEET AND RETURN TO:

AA1 SYSTEMS MANAGEMENT INC.
11101 GILROY ROAD
HUNT VALLEY, MD. 21030-1108

NOTE: MAKE A COPY FOR ON-SITE RECORDS

Date Prepared: 03/05/93

Task Order/ECP: E93SM05F063

Part Numbers Affected:

62828-90109-10 LEDWI SENSOR
LEDWI MPU CARD, STI P/N 1901-214

Documentation Included:

DETAIL INSTALLATION INSTRUCTIONS (SEE ATTACHMENT)

Description of Change:

This change is required in all ASOS LEDWI units fielded with the following serial numbers 0041-0309 (including spare cards). The EPROM located on the MPU card in the LEDWI changes from Rev. 3.49 to 3.61. The old firmware shall be returned to SMI along with this completed form.

Parts Included: Microcircuit P/N OWI5MPIF Rev. 3.61 1 each

QA Concurrence With FMK: _____

=====
Date Modification Complete: _____
Part Removed Serial # _____
Part Installed Serial _____
Person Completing Modification: _____

Were FMK Instruction: clear/concise: Y / N (circle)
Was FMK complete (parts, drawings, etc.): Y / N (circle)
If NO please comment (use back of form if needed):

Instructions for installing LEDWI Firmware 3.61

I. Replace the LEDWI Firmware

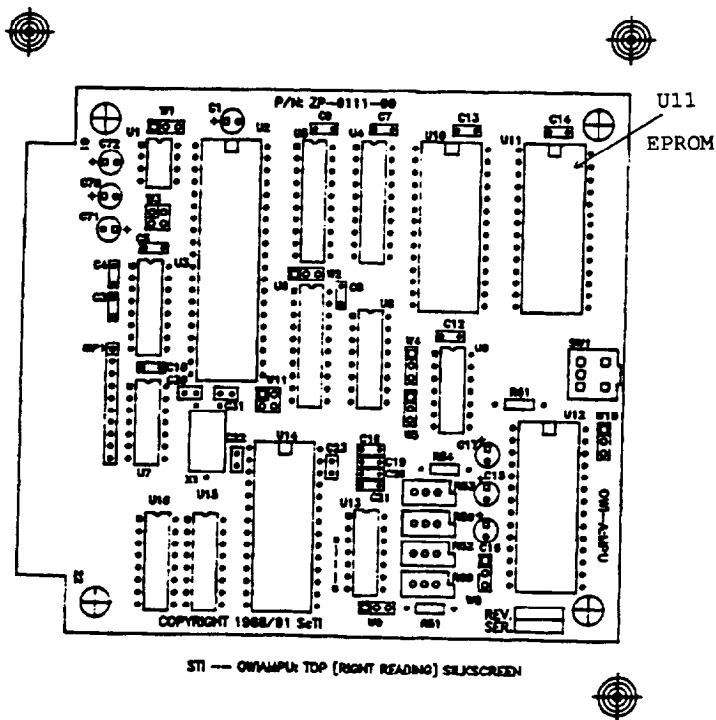
1. At the DCP, turn the LEDWI circuit breakers to 'OFF'.
2. At the LEDWI, open the electronics enclosure door.
3. Remove the MPU card located in the card cage, third slot from the top.
4. Referring to the attached assembly drawing on page 2, carefully remove the EPROM located in the U11 position.

USE CAUTION WHEN REMOVING AND REPLACING THE FIRMWARE!

5. Install the new Rev 3.61 EPROM in the U11 position of the MPU card.
6. Reinstall the MPU card in third slot of the card cage.
7. Close and secure the door of the electronics enclosure.
8. At the DCP, turn the LEDWI circuit breakers to 'ON'.

II. Validate the change

1. At the OLD, verify that present weather data is being received on the 12-hour screen. The data will display 'M' for missing while the sensor was turned off.
2. Bring up the LEDWI maintenance screen and verify that the sensor is passing all self-tests. If at least 10 minutes have passed since the sensor was turned on, the data quality should be "P" for pass also.
3. Clear all errors after the sensor self-test and data quality report pass.
4. Exit the maintenance screen and bring up the syslog 'write' screen. Annotate the changes made to the LEDWI.



SCIENTIFIC TECHNOLOGY, INC. 2 Research Place Rockville, MD 20850		
Title: OWI-A: MPU CIRCUIT BOARD		
Size: C	Number: STI-1103-0094	Revision: -
Date: 08/05/91	Drawn By: D. A. WILLIAMS	
File: OWI-MPU.PCB	Sheet: 1	of 1

ASOS MODIFICATION NOTE 6 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM

SUBJECT : Replacement Data Collection Platform (DCP) Circuit Breaker for the Ceilometer

PURPOSE : The ceilometer circuit breaker in the DCP is underrated and is being replaced with a circuit breaker rated for 10 amps.

EQUIPMENT AFFECTED: ASOS DCP units 2, 3, and 4

PARTS REQUIRED : 10 amp circuit breaker, 1 ea., P/N 62828-90037-7
Identification Label, 1 ea.

MOD PROCUREMENT : The above parts will be provided by the contractor, AAI Systems Management, Inc., as ASOS Field Modification Kit (FMK) #037. ECP: E92SM050F060

SPECIAL TOOLS REQUIRED : None

TIME REQUIRED : 0.5 hour

EFFECT ON OTHER INSTRUCTIONS : None.

CERTIFICATION STATEMENT : This modification was tested by the contractor.

GENERAL


The DCP 6-amp circuit breaker (2A1A3A1) for the ceilometer is underrated. The circuit breaker (CB2) in the Laser Beam Ceilometer CT12K is rated for 10 amps. This breaker supplies line power from the DCP to the window conditioner relays K1 and K2. K1 turns the blower on and K2 controls the heater. The relay contacts are arranged so heating cannot be supplied unless the blower is on. In some cases when the window conditioner is activated, this causes the DCP circuit breaker (2A1A3A1) to exceed the 6 amp current rating.

PROCEDURE

Follow installation instructions for ASOS Field Modification Kit (FMK) - #037 provided by AAI Systems Management, Inc.

REPORTING MODIFICATION

Target date for completing this modification is 30 days after receipt of parts. Report completed modification on WS Form H-28, Engineering Progress Report, according to instructions in EHB-4, part 2, using reporting code ASOS.



J. Michael St. Clair
Chief, Engineering Division

Attachment

SID _____

FMK # 037

ASOS FIELD MOD KIT (FMK)

CONTRACT 50-SANW-1-00050

UPON COMPLETION OF MOD, COMPLETE LOWER SECTION
OF THIS SHEET AND RETURN TO:

AAI SYSTEMS MANAGEMENT INC.
11101 GILROY ROAD
HUNT VALLEY, MD. 21030-1108

NOTE: MAKE A COPY FOR ON-SITE RECORDS

Date Prepared: 6/02/93

Task Order/ECP: E92SM0S0F060

Documentation included: INSTALLATION PROCEDURE (ATTACHMENT 1)

Description of Change: REPLACE 6 amp CIRCUIT BREAKER WITH 10 amp

Parts Included: 10 amp CIRCUIT BREAKER P/N 62828-90037-7 QTY. 1
IDENTIFICATION LABEL QTY. 1

QA Concurrence with FMK: _____

=====

Date modification complete: _____

Part Removed Serial # _____

Part Installed Serial # _____

Person Completing Modification: _____

Were FMK instructions clear/concise: Y / N (circle)

Was FMK complete (parts, drawings, etc.): Y / N (circle)

If NO, please comment (use back of form if needed):

DESCRIPTION OF CHANGE: Replace CB2, 6 amp circuit breaker, in the ceilometer circuit breaker module, with a 10 Amp circuit breaker.

EQUIPMENT SUPPLIED: 10 AMP CIRCUIT BREAKER 1 ea P/N 62828-90037-7
Identification Label 1 ea

1. Set output power switch S1 on the UPS status panel to OFF (0) position. Output indicator on status panel extinguishes. (CLASS 2 ONLY)
2. Set primary circuit breaker module 2A1A3A1 to OFF position.
3. Remove facility power from DCP cabinet by setting DCP circuit breaker in AC Junction Box to off.
4. At DCP battery box Disconnect connector W031-P1 from J1. (CLASS 2 ONLY)
5. Loosen two captive screws securing module retaining strip to power control module rack.
6. Remove module retaining strip from assembly.
7. Locate circuit breaker module 2A1A3A2 marked CH1.
Place fingers behind module faceplate and pull outward.
Remove module from rack.
8. Locate 6 amp circuit breaker CB2 (marked HTR on faceplate).
9. Remove two Phillips screws securing circuit breaker to faceplate.
10. Remove CB2-Line/A1TB1-4 wire from circuit breaker. Remove
CB2-LOAD/A1TB1-3 wire from circuit breaker.
11. Install new 10 amp circuit breaker to faceplate with two Phillips screws, ensuring the LINE and LOAD markings on circuit breaker face up.
12. Install CB2-LINE/A1TB1-4 Wire onto the circuit breaker terminal marked "LINE".
13. Install CB2-LOAD/A1TB1-3 wire onto the circuit breaker terminal marked "LINE".
14. Install Identification Label 97384 ASSY 62828-40155-80 over existing label on circuit breaker module.

Attachment 1

15. Align module with rack mounted guides and carefully push module into rack until firmly seated in rack mounted connector.
16. Reinstall module retaining strip and hand tighten two captive screws.
17. At DCP battery box connect connector W031-PI to J1.
(CLASS 2 ONLY)
18. Apply facility power to DCP cabinet setting DCP circuit breaker in AC junction box to ON position.
19. Set primary circuit breaker module 2A1A3A1 to ON position.
20. Set output power switch on UPS status panel to 1 (ON) position. (CLASS 2 Only)
21. Check for proper system operation.

ASOS MODIFICATION NOTE 7 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM

SUBJECT : Automated Surface Observing System (ASOS) Software Version 2.0

PURPOSE : To add maintenance capability and operational enhancements for the ASOS.

EQUIPMENT AFFECTED: ASOS

PARTS REQUIRED : Microcircuit P/N 62828-45002-1
Microcircuit P/N 62828-45003-1
Microcircuit P/N 62828-45004-1
Microcircuit P/N 62828-45005-1

MOD PROCUREMENT : The above parts will be provided by the contractor, AAI Systems Management, Inc., as an ASOS Field Modification Kit (FMK). ECP No. E93SM05F077
ECN No. 21465.

SPECIAL TOOLS REQUIRED : IC insertion tool
Small flat-tipped screwdriver
Conductive foam
Electrostatic discharge (ESD) straps

TIME REQUIRED : 1 hour

EFFECT ON OTHER INSTRUCTIONS : None.

CERTIFICATION STATEMENT : This modification was successfully tested for operational integrity in the Engineering Design Branch Laboratory.

GENERAL

This modification note provides procedures to upgrade the ASOS software by removing and replacing erasable programmable read only memory (EPROM). This note provides procedures for "Before Installing Firmware" and "After Installing Firmware." Information on changes and fixes implemented in version 2.0 is attached to this note.

PROCEDURE

Reference installation instructions for "Field Modification Kit (FMK) - #31 and #15A (EHB-11, Section 3.6, Modification Note 1) ASOS Software Upgrade" provided by AAI Systems Management, Inc. Both modifications must be completed prior to or concurrent with this modification note.

CAUTION

Be careful to protect the electronics on the ACU memory and CPU boards during this procedure. Do not reconfigure any jumpers on the ACU memory or the ACU CPU boards unless instructed by the procedure.

BEFORE INSTALLING FIRMWARE

1. Call the AOMC at 1-800-242-8194. Inform the person who answers the phone at which office you will be installing new firmware. Confirm that AOMC will provide access to the site-specific data base, Coordinate with the AOMC, then upload current configuration status before installing the new firmware.
2. For commissioned sites, get approval of the responsible MIC/OIC before starting installation. For non-commissioned sites, the el tech must coordinate with the site MIC/OIC before starting installation. You may install on any day of the month if permission is granted and the restrictions in steps 3 and 4 are complied with.
3. Commissioned Sites Only: Do not start installation during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of those conditions is expected within 3 hours. These meteorological conditions will be defined by the responsible MIC/OIC.
4. Do not start firmware installation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Although about 45 minutes should be sufficient, allow 1 hour to complete installation and restart ASDS.
5. Immediately before beginning work at NWS staffed sites, the MIC/OIC/Observer will inform the tower and any other critical users that ASOS will be shut off for firmware upgrade (unstaffed sites, the el tech will inform tower). He/She will alert towers using Controller Video Displays (CVD) and Operator Interface Devices (OID) to log off and shut down display power to avoid confusion. At commissioned sites only, download the following data to laptop using the direct command mode: 5-minute data (12 hrs.), and SYSLOG information (24 hrs.), SHEF messages (24 hrs.), and any 2-hour archive files.

15. Align module with rack mounted guides and carefully push module into rack until firmly seated in rack mounted connector.
16. Reinstall module retaining strip and hand tighten two captive screws.
17. At DCP battery box connect connector W031-PI to J1.
(CLASS 2 ONLY)
18. Apply facility power to DCP cabinet setting DCP circuit breaker in AC junction box to ON position.
19. Set primary circuit breaker module 2A1A3A1 to ON position.
20. Set output power switch on UPS status panel to 1 (ON) position. (CLASS 2 Only)
21. Check for proper system operation.

DESCRIPTION OF CHANGE: Replace CB2, 6 amp circuit breaker, in the ceilometer circuit breaker module, with a 10 Amp circuit breaker.

EQUIPMENT SUPPLIED: 10 AMP CIRCUIT BREAKER 1 ea P/N 62828-90037-7
Identification Label 1 ea

1. Set output power switch S1 on the UPS status panel to OFF (0) position. Output indicator on status panel extinguishes. (CLASS 2 ONLY)
2. Set primary circuit breaker module 2A1A3A1 to OFF position.
3. Remove facility power from DCP cabinet by setting DCP circuit breaker in AC Junction Box to off.
4. At DCP battery box Disconnect connector W031-P1 from J1. (CLASS 2 ONLY)
5. Loosen two captive screws securing module retaining strip to power control module rack.
6. Remove module retaining strip from assembly.
7. Locate circuit breaker module 2A1A3A2 marked CHI. Place fingers behind module faceplate and pull outward. Remove module from rack.
8. Locate 6 amp circuit breaker CB2 (marked HTR on faceplate).
9. Remove two Phillips screws securing circuit breaker to faceplate.
10. Remove CB2-Line/A1TB1-4 wire from circuit breaker. Remove CB2-LOAD/A1TB1-3 wire from circuit breaker.
11. Install new 10 amp circuit breaker to faceplate with two Phillips screws, ensuring the LINE and LOAD markings on circuit breaker face up.
12. Install CB2-LINE/A1TB1-4 Wire onto the circuit breaker terminal marked "LINE".
13. Install CB2-LOAD/A1TB1-3 wire onto the circuit breaker terminal marked "LINE" Load
14. Install Identification Label 97384 ASSY 62828-40155-80 over existing label on circuit breaker module.

Attachment 1

6. Do not begin the installation process, i.e., halt ASOS, until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.
7. Disable all hardware and dial communication ports to AFOS (REVUE-SITE-CONFIG-COMMS). The system voice function will automatically broadcast "not available" message when the ACU power is turned off.
8. Make the appropriate SYSLOG entries (MAINT-ACT-FMK) #15B.

AFTER INSTALLING FIRMWARE

See ASOS Modification Note 1, Appendix A, for a description of the time required to reboot ASOS and sensor response time after a new firmware load.

9. When ASOS is restarted at unstaffed sites, call to inform towers using CVDs and OIDs to turn on their displays. (At staffed sites, the MIC/OIC observer will call the tower).
10. If, on-site NWS staff provides backup while the installation is underway, no special observation is needed when ASOS is restarted. Proceed to step 11.

If there is no backup on site and a record observation was missed during the installation, a special observation must be taken when ASOS is restarted. The el tech should take the following steps at the ASOS keyboard after installation:

- a. Press [SIGN].
- b. Type his/her initials and press [RETURN].
- c. Type the observer level password and press [RETURN].
- d. Press [GENOB].
- e. Press [SPECL].
- f. Press [EXIT].
- g. Press [SIGN].
- h. Type his/her initials again and press [RETURN].
- i. Press [RETURN] twice. This signs the "observer" off ASOS.
- j. Leave ASOS running.

Note: The "observer" must sign off before the 5-minute edit time is up.

11. Inform office staff that ASOS is again operational and that, because at most, 15 minutes remain until the next hourly observation, augmentation of the ceiling might be required. It might also be necessary to augment several elements or even enter manually an entire observation. The chart below indicates how long it takes after start up for ASOS to report each observation element automatically.

Times Needed for Elements to be Reported Automatically

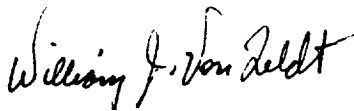
	<u>Minimum</u>	<u>Maximum</u>
Pressure	60 seconds	10 minutes
Precipitation Amount	60 seconds	*
Wind direction	2 minutes	7 minutes
Wind speed	2 minutes	7 minutes
Precipitation Type	2 minutes	*
Temperature5 minutes	10 minutes
Dew Point	5 minutes	10 minutes
Visibility	10 minutes	15 minutes
Obstruction to Visibility	10 minutes	*
Ceiling	30 minutes	35 minutes


* Maximum time not applicable since phenomena may not be present. ("Minimum" time applies if phenomena is present).

12. Verify that ASOS transmitted an hourly observation. Call the AOMC at 1-800-242-8194 and tell the operator:
 - a. Your location,
 - b. That installation of the new firmware has been completed, and
 - c. That ASOS is operational.
13. Enter in the syslog that maintenance has been completed.
14. At an expansion site with ATCT, the el tech will contact ATCT and supply information on the following:
 - a. ASOS maintenance completed,
 - b. ASOS restored to service, and
 - c. Tower CVDs and OIDs need to be turned on, and TRACON asked to turn on their displays.

REPORTING MODIFICATION

Target date for completion of this modification is 30 days after receipt of parts. Report completed modification on WS Form H-28, Engineering Progress Report, according to instructions in EHB-4, part 2, using reporting code ASOS.



 J. Michael St. Clair
Chief, Engineering Division

Attachments

CAUTION: THE FOLLOWING PROCEDURE HAS CHANGED. READ BEFORE PROCEEDING !!!

SID _____

FMK# 15B

ASOS FIELD MOD KIT (FMK)

CONTRACT 50-SANW-1-00050

UPON COMPLETION OF MOD. COMPLETE LOWER SECTION OF THIS SHEET AND RETURN ALONG WITH THE OLD PROMS TO:

AAI SYSTEMS MANAGEMENT INC.
11011 GILROY ROAD
P.O. BOX 238
HUNT VALLEY, MARYLAND 21030-0238

Date Prepared: 01/14/93

Task Order/ECP: E93SM05F077

ECN No. 21465

Part Numbers Affected:

62828-47008-10	CIRCUIT CARD ASSY.	
62828-45002-1	MI CROCI RCUI T,	EPROM
62828-45003-1	MI CROCI RCUI T,	EPROM
62828-45004-1	MI CROCI RCUI T,	EPROM
62828-45005-1	MI CROCI RCUI T,	EPROM

Documentation Included: Detailed Installation Instructions (see attachment)

Description of Change:

The EPROMs located on the memory board in the ACU change to Revision 2.0

Parts Included:

Mi croci rcui t	P/N	62828-45002-1	1	EA	SR-2.0
Mi croci rcui t	P/N	62828-45003-1	1	EA	SR-2.0
Mi croci rcui t	P/N	62828-45004-1	1	EA	SR-2.0
Mi croci rcui t	P/N	62828-45005-1	1	EA	SR-2.0

QA Concurrence With FMK:

Date Modification Complete:

Part Removed:

Serial # _____

Part installed:

Serial # _____

Person Completing Modification: _____

Were FMK Instructions clear/concise? Y/N (circle)

Was FMK complete? (parts, drawings, etc.) Y/N (circle)

If NO, please comment (use back of form, if needed):

ASSEMBLY DRAWING

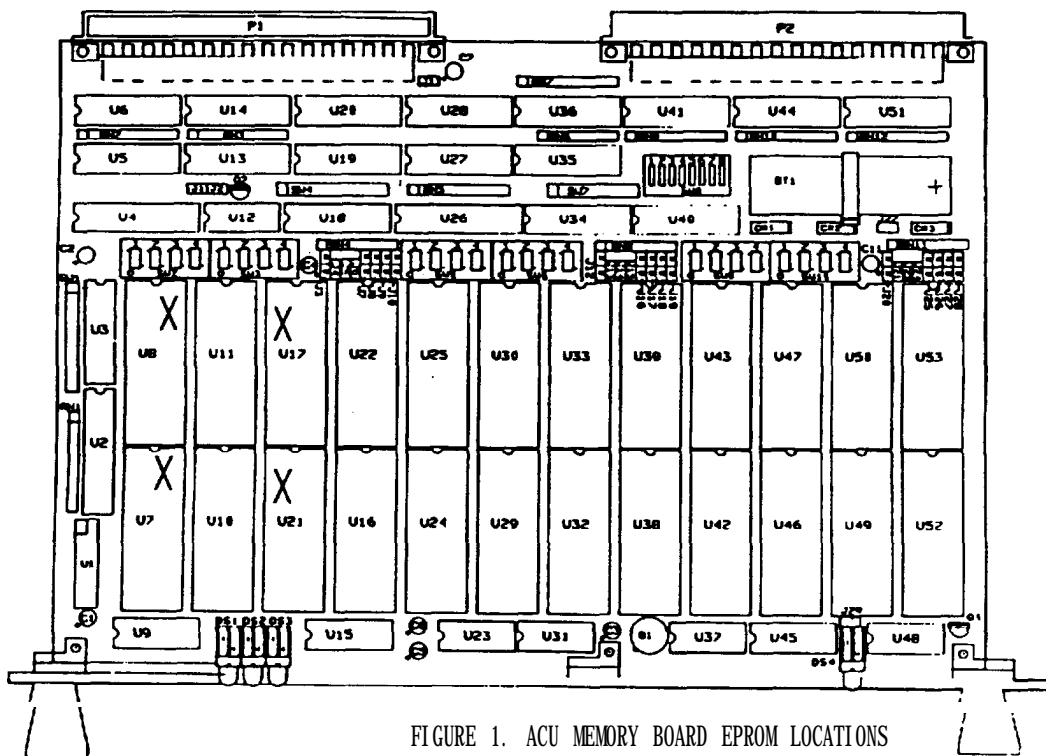


FIGURE 1. ACU MEMORY BOARD EPROM LOCATIONS

EPROM DESIGNATOR	PART NUMBER	FUNCTION
U6	62828-45002-1	BYTE 0
U17	62828-45003-1	BYTE 1
U7	62828-45004-1	BYTE 2
U21	62828-45005-1	BYTE 3

INSTRUCTIONS

FIELD MODIFICATION KIT - ASOS SOFTWARE VERSION UPGRADE

1.0 UPGRADING ASOS SOFTWARE

1.1 GENERAL

All ASOS application software is contained on four erasable programmable read only memory (EPROM) integrated circuits (IC) on ACU memory board 1A2A3. Figure 1 illustrates the ACU memory board and identifies the four EPROMs (U8, U17, U7, and U21). The EPROMs are 32-pin dual in-line package (DIP) CMOS devices, each providing 512K x 8 bits of storage. Upgrading ASOS software requires only replacing the four EPROMs on the ACU memory board with higher revision level ICs.

The four EPROMs on the ACU memory board contain both the ACU application program and the DCP application program. The ACU CPU runs the ACU application program directly from the ACU memory board. The DCP application program must first be downloaded from the ACU memory board to RAM storage in the DCP before it can be run by the DCP CPU.

Sites without a local OID (i.e., no RS232 connected for the primary OID) should attach a terminal to the LOCAL OID port of the ACU (522) before proceeding.

1.2 SOFTWARE UPGRADE PROCEDURE

Table 1 provides the procedure to upgrade ASOS software by removing and replacing the four EPROMs on the ACU memory board. After new EPROMs are installed, this procedure cold starts both the ACU and associated DCPs.

If the ACU PROMs in the system are 1.70 or higher, the ACU is no longer cold started by removing battery jumper J22 (Figure 1) to clear all RAM on the board. The next step requires receiving a download of site-specific data from the AOMC. The DCPs are cold started by performing a hard reset of each DCP from the processor status page on the OID. After completion of the upgrade procedure, the EPROMs removed from the ACU memory board should be packaged in appropriate electrostatic discharge (ESD) protective material for return.

NOTE: There may be an approximate 20-minute wait required to access the AOMC.

Table 1. Replacing ACU Firmware

Step Procedure

REMOVAL

Tools and Materials Required: IC insertion tool
Small flat-tipped screwdriver
Conductive foam

1. If printer is on-line, take it off-line by pressing ON-LINE switch on printer front panel. ON-LINE indicator extinguishes.

CAUTION

Damage to equipment may result if power is not removed prior to removal or installation. Ensure that OUTPUT POWER switch is set to 0 (off) and facility power is removed.

To avoid damage to circuit boards and integrated circuits, use proper ESD handling procedures, including the use of a grounding strap when performing the following steps.

2. Set OUTPUT POWER switch on UPS status panel to 0 (off) position. OUTPUT indicator on status panel extinguishes.
3. Remove facility power from ACU cabinet.
4. Using small flat-tipped screwdriver, loosen captive screws located at top and bottom of ACU memory board 1A2A3.
5. Press extractor handles at top and bottom of ACU memory board 1A2A3 in opposite directions to release board and remove board from rack.
6. On underside of board using small flat-tipped screwdriver, remove three screws and flat washers securing front panel to board. Remove board from front panel.
7. IF THE ACU PROMS IN THE SYSTEM ARE 1.70 OR HIGHER PROCEED TO STEP 8, OTHERWISE CONTINUE WITH STEP 7.

Remove battery jumper J22 from ACU memory card. Jumper will be reinstalled during installation procedure.

CAUTION

Throughout this procedure, discharge screwdriver before and during use by touching tool to grounded chassis surface. Failure to comply may result in damage to integrated circuits.

Table 1 (continued)

CAUTION

Lift integrated circuit as evenly as possible. Failure to comply may result in damage to integrated circuits.

8. From front of board, slide small flat-tipped screwdriver between integrated circuit U7 and its IC socket. Carefully pry up on U7 to lift it from socket as evenly as possible. Remove U7 from socket and place in conductive foam or on some other static-free surface.
9. Repeat Step 8 for the following integrated circuits: U21, U8, and U17.

INSTALLATION

Tools Required: IC insertion tool
Small flat-tipped screwdriver

<u>Step</u>	<u>Procedure</u>
-------------	------------------

1. Verify that printer is off-line.

CAUTION

Damage to equipment may result if power is not removed prior to removal or installation. Ensure that OUTPUT POWER switch is set to 0 (off) and facility power is removed.

To avoid damage to circuit boards and integrated circuits, use proper ESD handling procedures, including the use of a grounding strap when performing the following steps.

2. Verify that OUTPUT POWER switch on UPS status panel is set to 0 (off) position and OUTPUT indicator on status panel is extinguished.
3. Verify that facility power is removed from ACU cabinet.

CAUTION

Throughout this procedure, discharge IC insertion tool before and during use by touching tool to grounded chassis surface. Failure to comply may result in damage to integrated circuits.

4. Using IC insertion tool, remove new EPROM integrated circuits from protective packaging and insert into ACU memory board sockets in accordance with the following chart. Ensure that EPROMs are installed with pin 1 (as identified by notch in top of IC) oriented toward board connector P1 as shown on Figure 1.

Table 1 (continued)

IC socket	IC part number
U8	62828-45002-1
U17	62828-45003-1
U7	62828-45004-1
U21	62828-45005-1

5. Using a small flat-tipped screwdriver, install three flat washers and screws securing front panel to board.
6. Holding ACU memory board by handles, position board with component side to the right and carefully slide board into card rack on its guides. Align board with rear connector and press into place.
7. Using small flat-tipped screwdriver, tighten captive screws located at top and bottom of board.
8. Apply facility power to ACU cabinet.
9. Set OUTPUT POWER switch to 1 (on) position.
10. Place printer on-line by pressing ON-LINE switch on printer front panel. ON-LINE indicator illuminates.
11. With power applied to ACU and OID and after a brief warmup delay, OID displays 1-minute display. If display is not being updated, press HELP key twice to refresh screen. The NEED SID AND AOMC PHONE message appears at top of screen.

If this does not occur, return to REMOVAL procedure, step 1. Follow the steps until the ACU memory board is removed. Ensure the ACU PROMs are installed correctly. Follow INSTALLATION procedures to replace the ACU memory board. If the system is still not functioning correctly, contact Al Wissman at (301) 713-0260.
12. At OID, sign on to system as a technician.
13. Display external communications page on OID (sequentially press REVUE-SITE-CONFIG-EXTRN keys from 1-minute display). Enter phone number of AOMC (1-800-253-4717) into AOMC PHONE NUMBER field and press EXIT function key.
14. Display site physical page on OID (sequentially press REVUE-SITE-PHYS function keys from 1-minute display). Enter three or four character SID code in STATION IDENTIFIER field and press EXIT function key. The system then calls the AOMC and receives a download of site-specific data.

Table 1 (continued)

15. Display AOMC version page on OI D (sequentially press REVUE-SITE-VERSN-AOMC function keys from 1-minute display). This will allow you to observe that all the files are being downloaded from the AOMC. All status fields should read "COMPLETE" in approximately 5 minutes. Press EXIT.

NOTE: The following steps could start the DCPs.

16. Display maintenance page on OI D (press MAINT function key from 1-minute display).
17. Using PREV/NEXT keys, position cursor over PROC field and press SEL key. The OI D displays the processor status page.
18. Using PREV/NEXT keys, position cursor over DCP #1 - HARD field and press RESET key. Respond "YES" and "ENTER" to the "ARE YOU SURE?" message. The corresponding status field displays INITIALIZING while the unit is initializing. The progress of the download can be monitored by the PERCENT COMPLETE message that appears at the top of the screen.

When the percent complete reaches 100, the DCP status field changes to RUNNING.

19. If the system contains more than one DCP, repeat step 19 for DCPs #2 and #3 as required.

1. After the FMK has been completed, clear any maintenance flags that occur as a result of the restart.
2. After the FMK has been completed, display the maintenance action page on OI D (sequentially press MAINT-ACT function keys from 1-minute display). Press FMK, enter the requested information. This will place a message in the SYSLOG indicating the type of maintenance performed. (Additional information on the maintenance action function may be found in the Software User's Manual.) Step 3 should be performed twice, once for each FMK.
3. Display the SW version page on the OI D (sequentially press REVUE-SITE-VERSN-SW function keys from 1-minute display). The following fields should display version 2.0: MEMORY ACU APPLICATION EPROM, MEMORY DCP APPLICATION EPROM, and MEMORY DCP APPLICATION RAM. (These fields may take 5-10 minutes before they all read 2.0.)

At this point, the FMK is complete. Please fill out the bottom of the first page of each FMK and return them ALONG WITH THE OLD PROMS to AAI Systems Management, Inc.

ASOS Software Version 2.0

The following represents a coordinated effort to define the changes and fixes included in software version 2.0. The software has been formally tested at SMI and is undergoing beta site testing by the Systems Program Office (SPO). An operational NWS field test is planned for July. This list has been coordinated with SPO.

Modifications

- 450 Photometer data quality checking logic was changed for sites near the poles. Specifically, there will be no data quality checks north of 67°N, there will be no nighttime photometer check between 55°N and 67°N (inclusive) from February through October, and there will be no daytime check between 55°N and 67°N (inclusive) from November through January.
- 453 There will be no photometer data quality checks south of 67°S.
- 452 The field for magnetic variation on the SITE PHYSICAL page will be increased to hold up to three digits to accommodate polar sites.
- 468 Tower visibility will no longer automatically reset after the hourly SAO transmission. This fix was requested by the FAA.
- 469 When logged on as an Air Traffic Control observer, there will no longer be an automatic logoff. This fix was also requested by the FAA.
- 470 Add an alarm to indicate the actual transmission of an SAO. This fix was requested by the FAA. Note: The alarm is exactly the same as the alarm triggering the edit window.
- 471 The system identifiers A02 and A02A will now be A02 and A02A. Since this software version will be installed on a site-by-site basis, it is important for any SAO decoders to be able to decode both.
- 472 The current specials logic looks only at the trend of any change in ceiling or visibility requiring the issuance of a special, i.e., falling or rising. When both occur during the edit time it is called a reversal of trend, and the special is deleted. However, this logic potentially may cause the cancellation of a valid special. If conditions were to fall through two special thresholds during the edit window, then rise back through one, a special may be cancelled that should have been issued. The new logic now looks at the last transmitted observation for verification of a reversal.

OTRs fixed by V2.0 (government generated trouble reports)

- 165 If a wind was manually edited into the SA0 during the day and this wind became the fastest two minute wind for the day, the daily summary page would indicate an incorrect time of the occurrence. It will now indicate the correct time.
- 174 During a heavy fog event with visibilities below 1/4 mile, false data quality check failures were generated. Tolerance levels have been adjusted to prevent this occurrence.
- 186 The dew point temperature was occasionally reported having a higher value than the ambient temperature. In V1.90, if the dew point temperature is more than 2 degrees higher than the ambient temperature, it will be reported missing. If it is within 2 degrees over the ambient temperature, it will be reported as equal to the ambient temperature.
- 189 There was an inaccurate TREND page title error message - it would report "Radio comms are failing" even if the system was hardwired. The new message will use the term "Radio/line driver."
- 196 There was an erroneous UPS message that referenced UPS batteries at class I stations that have no UPS. Now, there is no message.
- 197 SIO errors could not be cleared (changed from degraded condition causing '\$' in SA0) from the ACU maintenance screen at the lowest (fourth) level. Now this will be possible.
- 198 A cold restart caused an incorrect SYSLOG message date/time stamp - set the current year to '0' rather than the current year. Any SYSLOG messages that were generated from the time of the cold restart to the time ASOS called AOMC for time sync were unavailable for later download by direct command mode. The date/time stamp will now be correct after a cold restart.
- 201 There were no range limit checks on temperature, allowing the transmission of a temperature of 196 degrees. There will now be range limit checks - maximum reportable value of 130 degrees, minimum of -80 degrees, and maximum change of 6 degrees since the last non-missing 1-minute reading.
- 202 Tower visibility will now be included when entered in the 5-minute archive used for aircraft accidents.
- 209 When the wind sensor was frozen in place there were excessive examples of the wind sensor cycling between inoperative and operative in 1-minute intervals. Excessive messages are now limited.
- 212 There was an incorrect format in the remarks section - the TNO remark had no space after it when there was a report of the onset of precipitation (TNORBxx should be TNO RBxx).

- 213 Local sensors would "hang up" in test mode. If the wind sensor was configured as a local sensor, the technician would go into test mode to test the sensor and it would not go back to regular mode, forcing a warm start. It now returns to regular mode.
- 215 The ASOS algorithm for photometer data quality checks for 24 hours of night and day. This check needs to be added to the Addenda to Government Furnished Algorithms. Reference STRs 452 and 453.
- 217 The rainfall totals differed between the PCPN (hourly) numbers and the 6-hour total and 24-hour totals. This was caused by the lack of the tipping bucket correction factor in the 6-hour and 24-hour totals, related to a change in the processing for these totals from the ACU to the DCP. This correction will now be made.
- 221 On the daily summary page, the wind speed associated with the fastest 2-minute wind was frequently incorrect. It will now report correctly.
- 222 The daily and monthly summary pages reported precipitation totals that did not agree with the hourly PCPN when totaled for the period. This problem was fixed by the same change as 217.

STRs fixed by V2.0 (contractor generated trouble reports)

- 461 When the tipping bucket was configured as a local sensor, tips were not being recorded. Now they will be.
- 417 A warm start would cause all sensors status to be set ON, regardless of their status before the warm start. Now, a sensor that had been configured OFF will stay OFF after a warm start.
- 448 The monthly normals are being updated to floating point values from integers. They will be the new 30-year normals and will be provided by NCDC. Implementation issues at AOMC are being worked out.
- 487 There was at least one site unable to assign a modem to SIO slot 8. When a port with a modem assigned was changed to hardwire, the modem assigned before the change to hardwire was permanently unavailable. All sites will now be able to configure the modem to slot 8.
- 488 The Site ID field as fed to ADAS has to be four characters long. We were sending just three characters at sites with three character site IDs. We will now pad these with a space to make four characters for ADAS. This will not affect the appearance of the observation in AFOS.
- 489 When the wind speed is manually edited and becomes the peak wind for the day, the daily summary did not report the correct value. Now it will.
- 490 When wind values are manually edited to generate a wind special, the system correctly noticed the need for a special, would highlight the wind field, then 1 minute later the highlight would disappear. Five minutes later the system would initiate a special again and begin the

minutes later the system would initiate a special again and begin the 5-minute edit window. Now it works properly, highlighting the wind field during the 5-minute edit window, then transmitting the special.

ASOS MODIFICATION NOTE 8 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM

SUBJECT : Wind Sensor Assembly Upgrades

PURPOSE : To add maintenance capability and operational enhancements for the ASOS wind sensors

EQUIPMENT AFFECTED: ASOS

PARTS REQUIRED :

EPR0M P/N 31977 Rev. 2.07	
Brass adapters	qty. 2 as required
Cable, P/N 32335	qty. 1 as required
Cable, P/N 32329	qty. 1 as required
Molex connector	qty. 1 as required
Anti seize grease	qty. 1 tube
Conductive compound	qty. 1 tube as required
Wind speed transmitter, (MOD 1)	qty. 1
Wind direction transmitter, (MOD 1)	qty. 1

MOD PROCUREMENT : The parts for ASOS Field Modification Kit (FMK) #036 will be provided by the contractor, AA1 Systems Management, Inc. FMK #039 will only be provided for those sites that have either a seized adapter and wind direction or speed bottle. All requests for parts must be made through Bob McCormick.

SPECIAL TOOLS REQUIRED : None

TIME REQUIRED : 2 hours

EFFECT ON OTHER INSTRUCTIONS : None

CERTIFICATION STATEMENT : This modification is authorized by Engineering Change Proposals E93SM05F070, E93SM05F071, and E93SM05F072. It was successfully tested at seven sites in the Eastern, Southern, and Central Regions and the Test and Evaluation Branch in Sterling, Virginia.

GENERAL

This modification note provides procedures and instruction for two FMKs to upgrade the ASOS wind sensor assembly (copies are attached as Appendix A and B). The first procedure is to remove the wind processor board from the wind sensor electronics enclosure and replace EPROM U7 (Rev. 2.05) with Rev. 2.07.

This firmware upgrade improves the transfer function for the wind sensor. This procedure also provides vent holes in both crossarm wind sensor adapters. These vent holes will help prevent moisture condensation that contributes to premature bearing failures and excessive torque on the wind sensors. Finally, this procedure replaces current wind speed and wind direction bottles with Modification Note 1 bottles. These bottles include new bearings, shafts, optical chopper, and low temperature grease, which will improve performance.

The second procedure provides wind sensor crossarm brass adapter replacement. The brass adapter will help decrease the probability of the wind speed and direction transmitters from seizing on the crossarm assembly. The second procedure may not be necessary and is to be used **ONLY** if there is a seizure of the wind speed or direction transmitters on the crossarm assembly.

PROCEDURE

Follow installation instructions for FMK #036 and #039 provided by AAI Systems Management, Inc. The Engineering Division will provide FMK #039 to sites with a seizing problem. Call Bobby McCormick (301-713-1835) or Al Wissman (301-713-0261) for a replacement adapter.

Before and After Installation Procedures

Procedures Related to Installation of ASOS Firmware Version 2.07

BEFORE INSTALLING FIRMWARE

1. Call the AOMC at 1-800-242-8194. Inform the person who answers the phone at which site you will be installing new firmware.
2. Get approval of the site MIC/OIC before starting installation. You may install on any day of the month if permission is granted and the restrictions in step 3 are complied with.
3. **Commissioned Sites Only:** Do not start installation during bad weather: while precipitation is falling, during instrument flight rule (IFR) conditions, or if either is expected within 3 hours.

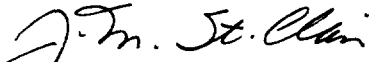
AFTER INSTALLING THE FIRMWARE

4. **IF MANUAL BACKUP IS AVAILABLE**, office staff must implement manual full backup observation procedures if installation runs past the regular hourly observation time or if a special must be generated. No special observation is needed when wind system is restarted.
5. Inform office staff that ASOS is again operational.
6. Verify that ASOS transmitted an hourly observation. Call the AOMC at 1-800-242-8194 and tell the operator:

- a. Your location,
- b. That installation of the new firmware has been completed, and
- c. That ASOS is operational.

REPORTING MODIFICATION

For commissioned sites, target date for completion of this modification is 30 days after receipt of parts. For other sites, target date for completion of this modification is 120 days after receipt of parts. Report completed modification on WS Form H-28, Engineering Progress Report, according to instructions in EHB-4, part 2, using reporting code ASOS. Make appropriate entries in the SYSLOG using the Maintenance Action Keys, Field Modification Keys and comment fields.



J. Michael St. Clair
Chief, Engineering Division

Attachments

SID _____

ASOS FIELD MOD KIT (FMK)
CONTRACT 50-SANW-1-00050

UPON COMPLETION OF MOD, COMPLETE LOWER SECTION
OF THIS SHEET AND RETURN TO:

AAI SYSTEMS MANAGEMENT INC.
11101 GILROY ROAD
HUNT VALLEY MD. 21030-1108

NOTE: MAKE A COPY FOR ON-SITE RECORDS

Date Prepared: 05/13/93 Task Order/ECP: E93SM05F070, E93SM05F071, and
E93SM05F072

Part Numbers Affected: 62828-90113 WIND SENSOR
 32321 BELFORT CROSSARM P/N
 31952 WIND PROCESSOR BD.

Documentation included:

1. Instructions to drill a .116 dia. vent hole in wind sensor crossarm adapters.
2. Drawing that illustrates location of holes and positioning of drill.
3. Instructions (attachment 1) for installing firmware version 2.07 with illustration.

Description of Change:

- * Drill one vent hole in both wind sensor crossarm adapters to prevent condensation. If wire bundle was cut to remove seized wind transmitter(s), refer to FMK 39 installation section.
- * Wind speed and direction transmitter change (MOD 1)
- * Wind processor firmware upgrade to version 2.07

QA Concurrence with FMK: _____

=====

Date Modification Complete: _____

Part Removed Serial # _____

Part Installed Serial # _____

Person Completing Modification: _____

Were FMK instructions clear/concise: Y/N (circle)

Was FMK complete (parts, drawings, etc.): Y / N (circle)

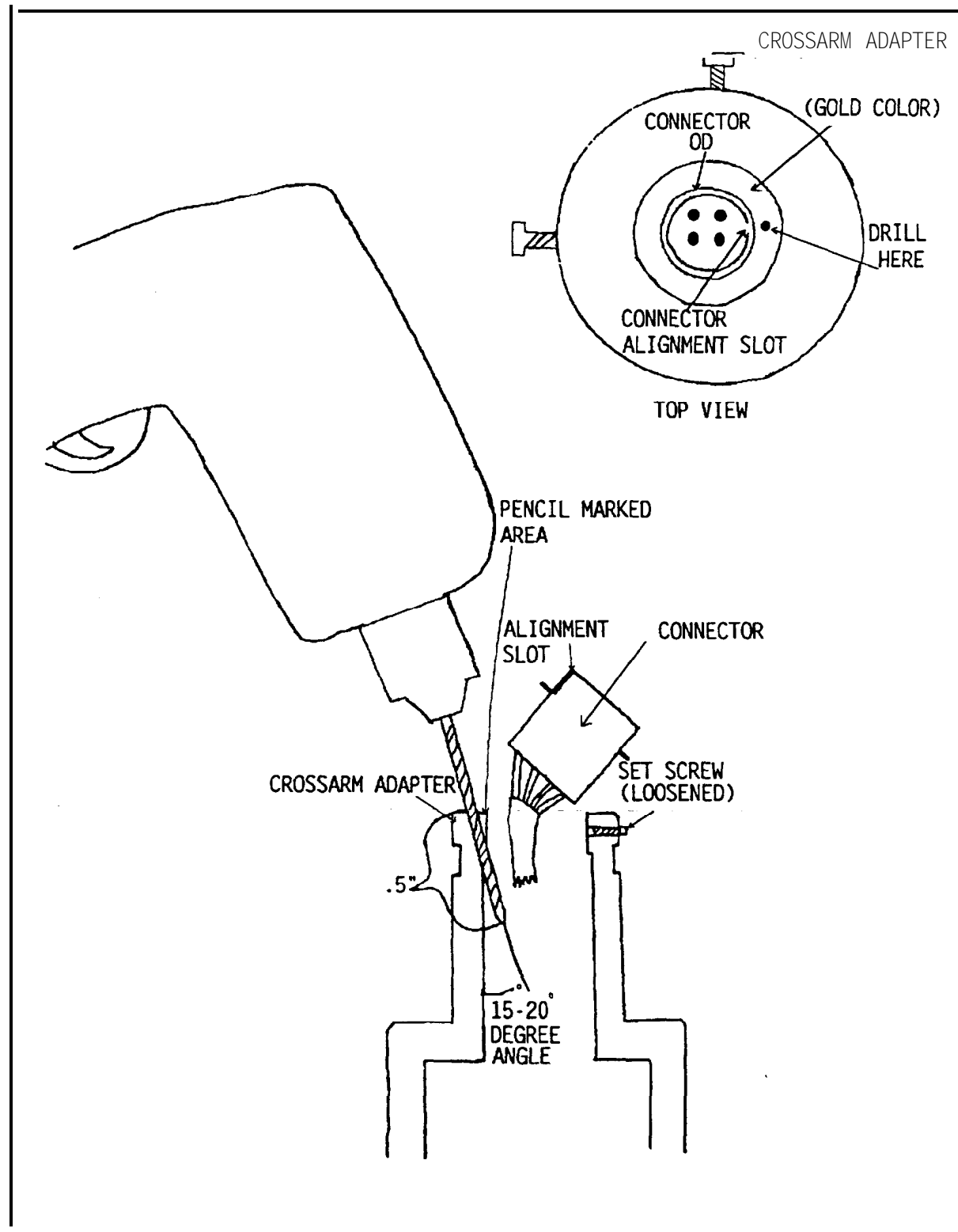
If NO, please comment (use back of form if needed):

WIND SENSOR UPGRADE

1. At the DCP, turn the wind circuit breaker to off.
2. Tilt the wind tower to the down position and secure. Cover the lightning rod to prevent accidental impalement.
3. Remove the wind speed sensor from crossarm support. Note: Cup nut is a left-hand thread.
4. Remove the wind direction sensor from crossarm support. Note: Vane nut is a left-hand thread.
5. With a pencil, make a mark on the crossarm adapter keeping it clear of the connector's OD and in line with the connector's alignment slot. (see drawing top view)
6. Loosen the two bolts securing the adapter into the crossarm. Loosen the two set screws securing the connector adapter and carefully pull the connector out of the adapter, taking care not to damage the wire bundle. Position and tape the connector/wire bundle clear of the pencil marked area.
7. Reassemble the adapter to the crossarm using the pencil mark for orientation.
8. You are going to drill one .116 dia. hole in each crossarm adapter (be sure to use safety glasses).
9. Holding the drill at a 15 to 20 degree angle, drill the hole. (See the figure on page A-5). Penetration of the drill bit should be approximately 0.5".
10. Reassemble connector into crossarm adapter removing all tape and orienting correctly. When properly drilled, hole should be clear of connector's OD and in line with the connector's alignment slot. Reassemble crossarm support using the MOD 1 wind speed and wind direction sensors provided. Apply a very small amount of anti-seize grease on the adapter. Do not apply grease near the newly drilled hole. Align the wind direction sensor using either the solar noon alignment procedure or the Davis Pelorus instrument alignment procedure. (These procedures can be found in the ASOS site technical manual paragraph 4.5.2.5.1 and 4.5.2.5.2.) Install firmware version 2.07 at this time per attachment 1. Check for proper operation.

ATTACHMENT 1

1. Remove hardware mounting the PCB p/n 82205 assy 31952 in the enclosure, then remove the PCB from the connector.
2. Locate U7 (p/n 31977 Rev 2.05) on the PCB and remove from the socket. (Use the PCB drawing supplied.)
3. Install new EPROM (Rev. 2.07) in socket, observing proper pin 1 orientation.
4. Make sure EPROM legs do not get bent during installation into socket.
5. Re-install the PCB into the connector in the enclosure, making sure it is fully seated in position.



SID _____

Appendix B
FMK # 039

ASOS FIELD MOD KIT (FMK)
CONTRACT 50-SANW-1-00050

UPON COMPLETION OF MOD, COMPLETE LOWER SECTION
OF THIS SHEET AND RETURN TO:

AAI SYSTEMS MANAGEMENT INC.
11101 GILROY ROAD
HUNT VALLEY, MD. 21030-1109

NOTE: MAKE A COPY FOR ON-SITE RECORDS

Date Prepared: 06/16/93

Task Order/ECP: E93SM05F071

Part Numbers Affected: 62828-90113 WIND SENSOR
32321 BELFORT CROSSARM P/N

Documentation Included: Wind sensor crossarm brass adapter replacement
instructions.

Description of Change: This FMK provides instructions to install brass
adapters on the wind sensor crossarms to prevent seizing of materials.

Parts Included:	Brass adapters	qty.	2		
	Cable	qty.	1	P/N	32335
	Cable	qty.	1	P/N	32329
	Molex connector				
	~ Anti seize grease	qty.	1 tube		
	Conductive Compound	qty.	1 tube		

QA Concurrence With FMK: _____

=====

Date Modification Complete: _____

Part Removed Serial # _____

Part Installed Serial # _____

Person Completing Modification: _____

Were FMK instructions clear/concise: Y / N (circle)
Was FMK complete (parts, drawings, etc.) Y / N (circle)
If NO, please comment (Use back of form if needed):

WIND SENSOR CROSSARM ADAPTER (BRASS) REPLACEMENT

Recommend two people complete this modification.

REMOVAL

1. At the DCP, turn the circuit breaker marked WIND to OFF. Remove power to the obstruction lights.
2. Lower tower to the down position and secure. Cover the lightning rod to prevent accidental impalement.
3. Remove the wind speed sensor transmitter and the wind direction sensor transmitter from the crossarm support. **Note: Cup and vane nuts are left-hand threads.**
4. Remove two bolts securing crossarm support to the wind tower. Pull crossarm support from tower taking care while sliding (P3) bracket assembly between the 120 VAC wires for the obstruction lights. Remove bracket assembly, then disconnect connector (J1) of the crossarm support and remove crossarm support from tower.
5. Remove two screws securing conduit cover and gasket and remove conduit cover and gasket from crossarm support.
6. Cut cables 32335 and 32329 located within the conduit outlet body of the crossarm support. At connector J1, pull the now cut section of cable out of the crossarm support. (Do not discard.) Cut the outer shrink tubing from the cable at the J1 end.
7. Loosen two screws securing each crossarm adapter to the crossarm support and remove crossarm adapters, connectors and severed cables from crossarm support.

INSTALLATION

1. Take new cable 32335 and feed (pins first) through the BRASS wind direction crossarm adapter (stamped with alignment line). Secure connector to adapter with two set screws, taking care to line up the slot in the connector with the alignment pin on the adapter. Locate the wind direction sensor side of the crossarm support (stamped with alignment line). Feed the cable through the arm until it exits the conduit outlet body. Pull cable outside of the conduit outlet body and secure crossarm adapter to crossarm support by tightening two screws.
2. Take new cable 32329 and feed (pins first) through the BRASS wind speed crossarm adapter and secure connector adapter with two set screws. Locate the wind speed sensor side of the crossarm support and feed the

cable through the arm until it exits the conduit outlet body. Pull cable outside of the conduit outlet body and secure **crossarm** adapter to **crossarm** support by tightening two screws.

3. At the conduit outlet body, take the two cables and tie lacing cord over them. Insert the nine pins into the new Molex connector, taking care to insert pins into their proper location. (Use old piece for reference.)
4. At the conduit outlet body, slide the newly formed cable down and out the bottom of the **crossarm** support.
5. Check P3 connector of cable P/N 32342, S100-2A8MT1W1, (tower signal cable) for corrosion. If connector is corroded replace tower signal cable. Cable may be obtained from Bob McCormick.
6. Apply a small amount of conductive grease in the P3 connector. Connect connector P3 of the tower signal cable (30-ft. cable) to J1 of the **crossarm** support and install **crossarm** support in top of tower.
7. Reassemble wind speed and direction transmitters and vane/cups. Apply a small amount of anti-seize grease on the adapters. Do not apply grease near the newly drilled hole. Align the wind direction sensor using either the solar noon alignment procedure or the Davis Pelorus Instrument alignment procedure. Check for proper operation.
8. Return Field Mod Kit cover sheet to AAI/SMI.

ASOS MODIFICATION NOTE 9 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM

SUBJECT : Temperature/Dewpoint Electronics Enclosure and Aspirator Assembly Replacement

PURPOSE : To improve the accuracy of the ASOS hygrothermometer

EQUIPMENT AFFECTED: ASOS

PARTS REQUIRED : Electronics enclosure
Temperature/dewpoint aspirator assembly
Tie wraps, qty 3

MOD PROCUREMENT : The above parts will be provided by the contractor, AAI Systems Management, Inc., as ASOS Field Modification Kit (FMK) #021.

SPECIAL TOOLS REQUIRED : None

TIME REQUIRED : 2 hours

EFFECT ON OTHER INSTRUCTIONS : None

CERTIFICATION STATEMENT : This modification is authorized by Engineering Change Proposal E92SM05F004. It has been successfully tested by the contractor for operational integrity. Testing has been completed at three Southern Region sites, three Central Region sites, Atlantic City, New Jersey, and Sterling, Virginia.

GENERAL

This modification note provides a procedure to remove and replace the H083 or 1088 hygrothermometer electronics enclosure and temperature/dewpoint aspirator assembly. A recent update to the temperature/dewpoint calibration resistors and processor board requires a change be made to all fielded ASOS H083 and 1088 hygrothermometer systems.

PROCEDURE:

Follow the removal and installation instructions for FMK #021.

READ THE PROCEDURE BEFORE PROCEEDING!!!

REPORTING MODIFICATION

Target date for completing this modification is 90 days after receipt of parts. Report completed modification on WS Form H-28, Engineering Progress Report, according to instructions in EHB-4, part 2, using reporting code ASOS.

Make appropriate entries in the SYSLOG using the Maintenance Action keys, Field Modification keys, and comment fields.



J. Michael St. Clair
Chief, Engineering Division

Attachment

SID _____

Appendix A
FMK #021

ASOS FIELD MOD KIT (FMK)

CONTRACT 50-SANW-1-00050

UPON COMPLETION OF MOD, COMPLETE LOWER SECTION
OF THIS SHEET AND RETURN TO:

AAI SYSTEMS MANAGEMENT INC.
11101 GILROY ROAD
HUNT VALLEY ND, 21030-1108

NOTE: MAKE A COPY FOR ON-SITE RECORDS

Date Prepared: 03/09/93

ECP: E92SM05F004

Part Numbers Affected 62828-90109,

Description of Change:

There was a recent update to the temperature/dew point calibration resistors and processor board in the electronics enclosure and aspirator assembly. This change is required for all fielded H083 and 1088 systems.

Remove and replace the temperature/dew point electronics enclosure and aspirator assembly. Utilize Installation Procedure A09, Section 2.7 (attached) for removal and installation reference. Document the enclosure serial number (removed and installed) below.

Parts Included: Electronics Enclosure, Temp/Dew Point Aspirator Assy, TyWrap (Qty. 3)

QA Concurrence with FMK: _____

=====

Date Modification complete _____

Part Removed Serial # _____

Part Installed Serial # _____

Person Completing Modification: _____

Were FMK instructions clear/concise: Y / N (circle)

Was FMK complete (parts, drawings, etc.): Y / N (circle)

If NO, please comment (use back of form if needed):

TEMPERATURE/DEWPOINT SWAPOUT PROCEDURE

WARNING

Death or severe injury may result if power is not removed from sensor prior to maintenance activities. Ensure that circuit breaker supplying power to sensor is set to OFF (right) position.

REMOVAL

1. Inside DCP cabinet, set circuit breaker on temperature/dewpoint sensor power control module to off (right) position.
2. Remove ground wire and lug from transmitter box.
3. Using large flat-tipped screwdriver, open temperature/dewpoint transmitter access door.
4. Disconnect AC power input wires from terminals TB1-1, TB1-2, and TB1-3 inside transmitter.
5. Using clockwise rotation, disconnect two fiber optic cables from underneath fiber optic module. Install protective plastic covers over fiber optic cable connectors.
6. Using large adjustable wrench, disconnect flexible conduit from transmitter.
7. Using 1/2-inch wrench, loosen bolts securing transmitter to sensor pad column support post.
8. With aspirator still connected to transmitter, remove temperature/dewpoint sensor from column.
9. Disassemble transmitter unit and aspirator from the angle irons and package in the shipping container provided with replacement unit. PLEASE RETURN THE ENTIRE UNIT. Retain the solar shield for use on the replacement unit. RETAIN THE HARDWARE AND ANGLE IRONS TO INSTALL REPLACEMENT UNIT. Replacement unit does not include new angle irons or hardware. Affix shipping label (provided) to the outside of the box and ship.

INSTALLATION

1. Remove aspirator and transmitter from the shipping container.
2. Locate bracket assembly (previously removed from old unit) and using 5/16-inch nut driver and No. 1 Phillips, remove the locknuts securing the medium and small angle irons to the bracket assembly.
3. Connect mounting bracket stamped with an O to hinged side of transmitter. Install two 1/2-inch standoffs securing bracket. Do not tighten standoffs.
4. Connect mounting bracket stamped with an X to the other side (non-hinged) of the transmitter. Install two 1/2-inch standoffs securing bracket. Do not tighten standoffs.
5. Position aspirator on mounting brackets so that cable is toward transmitter. Install four 3/8-inch locknuts securing aspirator on mounting brackets. Do not tighten locknuts.
6. Using No. 1 Phillips screwdriver and 5/16 nut driver, install four screws and locknuts securing small angle irons to top and bottom of support brackets. Do not tighten locknuts.
7. Using 5/16-inch nut driver and No. 1 Phillips screwdriver, install four screws and locknuts securing medium angle irons to each side of bracket assembly. Tighten locknuts securing medium and small angle irons to bracket assembly.
8. Using 3/8-inch nut driver, tighten four locknuts securing mounting bracket to aspirator.
9. Using 1/2-inch nut driver, tighten four standoffs securing mounting bracket to transmitter.
10. Position the solar shield over transmitter with longest side facing aspirator (fig 5.2.1).
11. Using No. 2 Phillips screwdriver, install four screws, lockwashers, and flat washers securing solar shield to standoffs on transmitter.
12. Using cable tie wraps, secure aspirator cable to support arm assembly as shown on figure 5.2.1. Be sure to leave service loop to allow removal of dewpoint sensor fan without cutting tywraps.
13. Connect connector P1 to connector J1 on transmitter.
14. Inside DCP cabinet, ensure that circuit breaker on temperature/dewpoint sensor power control module is set to off (right) position.

NOTE

Sensor must be mounted so that aspirator assembly is toward the south, over either grass or bare earth (whichever is the norm for the area; no gravel)

15. Slide transmitter on sensor pad mounting pole and orient sensor so that aspirator faces south (transmitter access door opens north). Using 1/2-inch wrench, install three mounting bolts securing sensor to mounting pole. Tighten nuts against mounting column to lock mounting bolts in position.
16. Install grounding lug to transmitter. Install ground wire to lug.
17. Open transmitter access door.
18. Carefully slide AC power and fiber optic cables through hole in bottom of transmitter. Using large adjustable wrench, secure flexible conduit to transmitter.
19. Connect AC power wiring to transmitter terminal board TB1 according to the following connection chart:

WIRE COLOR	TERMINAL	FUNCTION
Black	TB1-1	110 VAC
White	TB1-2	Neutral
Green	TB1-3	Chassis ground

20. Connect RX connector of fiber optic cable to RX connector underneath fiber optic module in transmitter (RX connector on module is nearest DB-9 electrical connector). Connect TX connector on fiber optic cable to remaining connector on fiber optic module.
21. At transmitter, set the following controls to the indicated positions:

CONTROL	POSITION
Power on/off switch	On (up)
Mode switch	OPR
Autobalance dial	000

22. Inside DCP equipment cabinet, set circuit breaker on temperature/dewpoint sensor power control module to on (left) position.
23. At temperature/dewpoint sensor, set power switch to on (up) position. Ensure that display on transmitter is illuminated and that fan in aspirator is operating (fan makes audible sound). If the correct indications are not observed, remove power from sensor immediately and troubleshoot sensor using procedures provided in chapter 5, section V of the ASOS Site Technical Manual.

24. Using procedures provided in the ASOS Site Technical Manual, paragraph 5.5.2.5, check temperature/dewpoint sensor DC power supplies.
25. Using procedures provided in the ASOS Site Technical Manual, paragraph 5.5.2.2, inspect and clean aspirator air passage and mirror.
26. Using procedures provided in the ASOS Site Technical Manual, paragraph 5.5.2.3, perform the optical loop adjustment.
27. Using procedures provided in the ASOS Site Technical Manual, paragraph 5.5.2.6, calibrate temperature/dewpoint sensor.
28. Using procedures provided in the ASOS Site Technical Manual, table 5.5.5, perform fan fail monitoring circuit adjustment.
29. At transmitter, close the access door.
30. At the OI D, using procedures provided in the ASOS Site Technical Manual, paragraph 1.3.10, configure the system to accept sensor inputs.
31. Using procedures provided in chapter 1 of the ASOS Site Technical Manual, perform diagnostic testing of the sensor.
32. After allowing sensor to stabilize its operation, observe 1-minute display to verify sensor operation and data reporting.

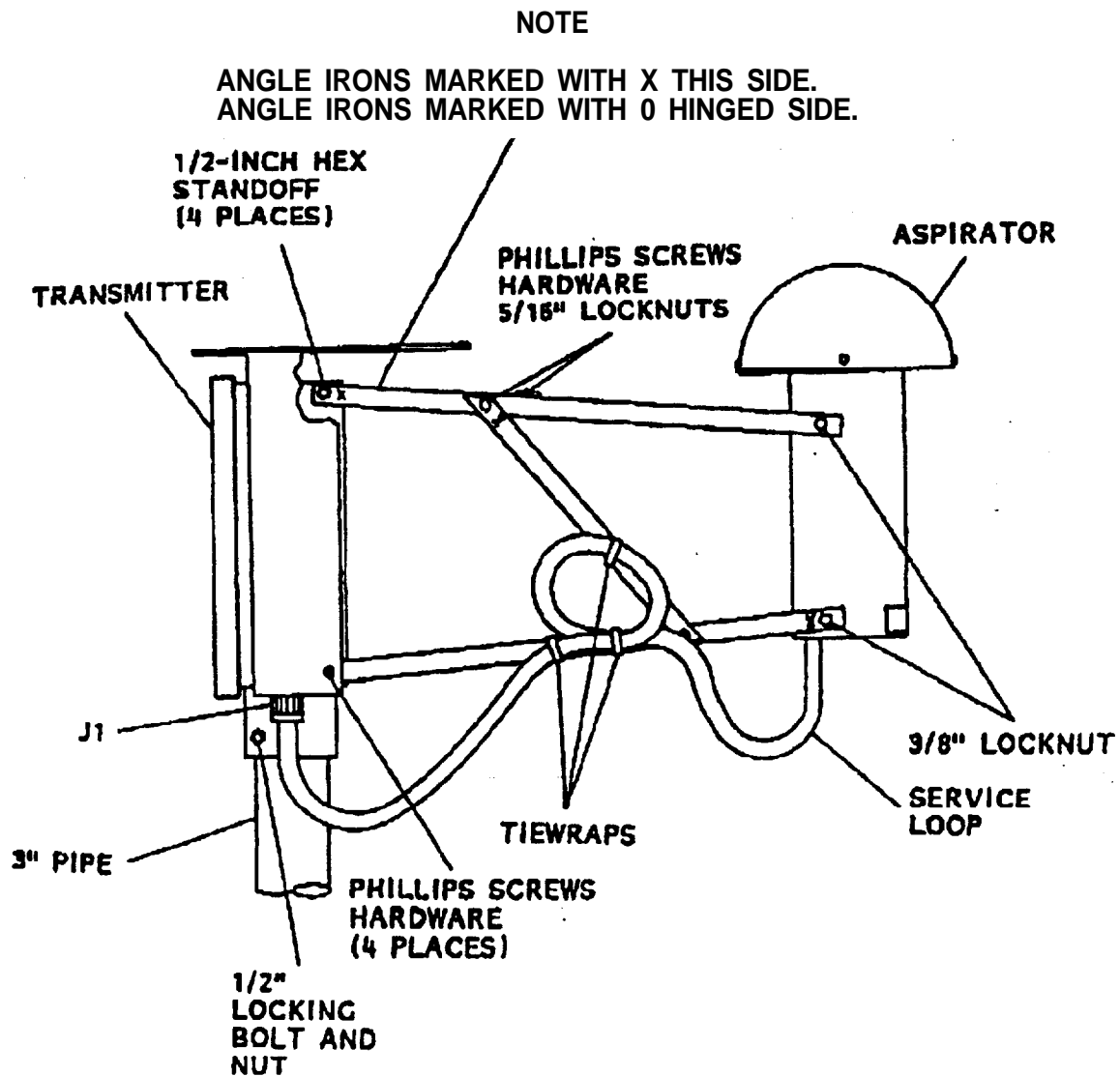


Figure 5.2.1, Temperature/Dewpoint Sensor Installation Diagram

ASOS MODIFICATION NOTE 10 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM

SUBJECT : ACU Software Version 2.1

PURPOSE : To add maintenance capability and operational enhancements for the ASOS

EQUIPMENT AFFECTED: ASOS

PARTS REQUIRED : Microcircuit P/N 62828-45002-1
Microcircuit P/N 62828-45003-1
Microcircuit P/N 62828-45004-1
Microcircuit P/N 62828-45005-1

MOD PROCUREMENT : The above parts will be provided through NLSC as an ASOS Field Modification Kit S100-FMK015D. ECP E93SM05F097

SPECIAL TOOLS REQUIRED : IC insertion tool
Small flat-tipped screwdriver
Conductive foam
Electrostatic discharge (ESD) straps

TIME REQUIRED : 1 hour

EFFECT ON OTHER INSTRUCTIONS : EHB-11, section 3.6, modification notes 14 and 15 are to be installed in conjunction with this modification.

CERTIFICATION STATEMENT : This modification is being tested for operational integrity in the Engineering Design Branch Laboratory and sites listed in Appendix B.

GENERAL

This modification note provides procedures to upgrade the ASOS software by removing and replacing erasable programmable read only memory (EPROM). This note provides procedures for "Before Installing Firmware" and "After Installing Firmware." Appendixes C, D, E and F attached to this note is information on changes and fixes implemented in firmware version 2.1. Reference ASOS Modification Notes 14 and 15 in EHB-11, Section 3.6.

PROCEDURE

Follow instructions provided in FMK 015D for installation of EPROMs U8, U7, U17, and U21 on the ACU memory board 1A2A3.

CAUTION

Be careful to protect the electronics on the ACU memory and CPU boards during this procedure. Do not reconfigure any jumpers on the ACU memory or the ACU CPU boards unless instructed by the procedure.

BEFORE INSTALLING FIRMWARE

1. Call the AOMC at 1-800-242-8194. Inform the person who answers the phone at which office you will be installing new firmware. Confirm that AOMC will provide access to the site-specific data base. Coordinate with the AOMC, then upload current configuration status before installing the new firmware.
2. For commissioned sites, get approval of the responsible MIC/OIC before starting installation. For non-commissioned sites, the el tech must coordinate with the site MIC/OIC before starting installation. You may install on any day of the month if permission is granted and the restrictions in steps 3 and 4 are complied with.
3. **Commissioned Sites Only:** Do not start installation during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of those conditions is expected within 3 hours. These meteorological conditions will be defined by the responsible MIC/OIC.
4. Do not start firmware installation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Although about 45 minutes should be sufficient, allow 1 hour to complete installation and restart ASOS.
5. Immediately before beginning work at NWS staffed sites, the MIC/OIC/Observer will inform the tower and any other critical users that ASOS will be shut off for firmware upgrade (unstaffed sites, the el tech will inform tower). He/She will alert towers using Controller Video Displays (CVD) and Operator Interface Devices (OID) to log off and shut down display power to avoid confusion. At commissioned sites only, download the following data to laptop using the direct command mode: 5-minute data (12 hrs.), and SYSLOG information (24 hrs.), SHEF messages (24 hrs.), and any 2-hour archive files.
6. Do not begin the installation process, i.e., halt ASOS, until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.
7. Disable all hardwire and dial communication ports to AFOS (REVUE-SITE-CONFIG-COMMS). The system voice function will automatically broadcast "not available" message when the ACU power is turned off.
8. Make the appropriate SYSLOG entries (MAINT-ACT-FMK) #015D

AFTER INSTALLING FIRMWARE

See page 4 for a description of the time required to reboot ASOS and sensor response time after a new firmware load.

9. When ASOS is restarted at unstaffed sites, call to inform towers using CVDs and OIDs to turn on their displays. (At staffed sites, the MIC/OIC observer will call the tower.)
10. If on-site NWS staff provides backup while the installation is underway, no special observation is needed when ASOS is restarted. Proceed to step 11.

If there is no backup on site and a record observation was missed during the installation, a special observation must be taken when ASOS is restarted. The el tech should take the following steps at the ASOS keyboard after installation:

- a. Press [SIGN].
- b. Type his/her initials and press [RETURN].
- c. Type the observer level password and press [RETURN].
- d. Press [GENOB].
- e. Press [SPECL].
- f. Press [EXIT].
- g. Press [SIGN].
- h. Type his/her initials again and press [RETURN].
- i. Press [RETURN] twice. This signs the "observer" off ASOS.
- j. Leave ASOS running.

Note: The "observer" must sign off before the 5-minute edit time is up.

11. Inform office staff that ASOS is again operational and that because at most 15 minutes remain until the next hourly observation, augmentation of the ceiling might be required. It might also be necessary to augment several elements or even enter manually an entire observation. The chart below indicates how long it takes after start up for ASOS to report each observation element automatically.

Times Needed for Elements to be Reported Automatically

	<u>Minimum</u>	<u>Maximum</u>
Pressure	60 seconds	10 minutes
Precipitation Amount	60 seconds	*
Wind direction	2 minutes	7 minutes
Wind speed	2 minutes	7 minutes
Precipitation Type	2 minutes	*
Temperature	5 minutes	10 minutes
Dew Point	5 minutes	10 minutes
Visibility	10 minutes	15 minutes
Obstruction to Visibility	10 minutes	*
Ceiling	30 minutes	35 minutes

* Maximum time not applicable since phenomena may not be present.
Minimum time applies if phenomena are present.

12. Verify that ASOS transmitted an hourly observation. Call the AOMC at 1-800-242-8194 and tell the operator:
 - a. Your location,
 - b. That installation of the new firmware has been completed, and
 - c. That ASOS is operational.
13. Enter in the SYSLOG that maintenance has been completed.
14. At an expansion site with ATCT, the el tech will contact ATCT and supply information on the following:
 - a. ASOS maintenance completed,
 - b. ASOS restored to service, and
 - c. Tower CVDs and OIDs need to be turned on, and TRACON asked to turn on their displays.

REPORTING MODIFICATION

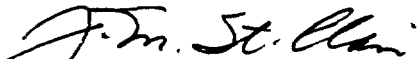
Target date for completion of this modification is 30 days after receipt of parts. Report completed modification on WS Form H-28, Engineering Progress Report for each system, according to instructions in EHB-4, part 2, using reporting code ASOS.

Make appropriate entries in the SYSLOG using the Maintenance Action keys, Field Modification keys, and comment fields. Follow these steps:

1. Log on as TECH.
2. Key the MAINT screen.
3. Key the ACTION page.
4. Key START - Stop here and perform the modification FMK-15D.
After FMK-15D is complete log on system.
5. Key the MAINT screen.

6. Key the ACTION page.
7. Key FMK - Enter the Field Mod Kit (FMK) number as follows: FMK15D
On the second line of the screen verify that only FMK15D is displayed.
Complete by entering Y in the Y/N if only FMK15D is displayed.
8. Check the SYSLOG and verify the FM message. Notify the AOMC via the telephone that FMK 15D is complete.

NOTE: Parts removed (EPROMs) should be returned to NRC as S100-FMK015D0LD.
NRC will reprogram the EPROMs for other ASOS applications.



J. Michael St. Clair
Chief, Engineering Division

Attachments

Appendix A
Appendix B
Appendix C
Appendix D
Appendix E
Appendix F

INSTRUCTIONS

FIELD MODIFICATION KIT - ASOS SOFTWARE VERSION UPGRADE

1. UPGRADING ASOS SOFTWARE

1.1 GENERAL

All ASOS application software is contained on four erasable programmable read only memory (EPROM) integrated circuits (IC) on ACU memory board 1A2A3. Figure 1 illustrates the ACU memory board and identifies the four EPROMs (U8, U17, U7, and U21). The EPROMs are 32-pin dual in-line package (DIP) CMOS devices, each providing 512K x 8 bits of storage. Upgrading ASOS software requires only replacing the four EPROMs on the ACU memory board with higher revision level ICs.

The four EPROMs on the ACU memory board contain both the ACU application program and the DCP application program. The ACU CPU runs the ACU application program directly from the ACU memory board. The DCP application program must first be downloaded from the ACU memory board to RAM storage in the DCP before it can be run by the DCP CPU.

Sites without a local OID (i.e., no RS232 connected for the primary OID) should attach a terminal to the LOCAL OID port of the ACU (522) before proceeding.

1.2 SOFTWARE UPGRADE PROCEDURE

Table 1 provides the procedure to upgrade ASOS software by removing and replacing the four EPROMs on the ACU memory board. After new EPROMs are installed, this procedure cold starts both the ACU and associated DCPs.

If the ACU PROMs in the system are 1.70 or higher, the ACU is no longer cold started by removing battery jumper J22 (Figure 1) to clear all RAM on the board. The next step requires receiving a download of site-specific data from the AOMC. The DCPs are cold started by performing a hard reset of each DCP from the processor status page on the OID. After completion of the upgrade procedure, the EPROMs removed from the ACU memory board should be packaged in appropriate electrostatic discharge (ESD) protective material for return.

NOTE: There may be an approximate 20-minute wait required to access the AOMC.

Table 1. Replacing ACU Firmware

Step	Procedure
------	-----------

REMOVAL

Tools and Materials Required: IC insertion tool
Small flat-tipped screwdriver
Conductive foam

1. If printer is on-line, take it off-line by pressing **ON-LINE** switch on printer front panel. **ON-LINE** indicator extinguishes.

CAUTION

Damage to equipment may result if power is not removed prior to removal or installation. Ensure that OUTPUT POWER switch is set to 0 (off) and facility power is removed.

To avoid damage to circuit boards and integrated circuits, use proper ESD handling procedures, including the use of a grounding strap when performing the following steps.

2. Set OUTPUT POWER switch on UPS status panel to 0 (off) position. OUTPUT indicator on status panel extinguishes.
3. Remove facility power from ACU cabinet.
4. Using small flat-tipped screwdriver, loosen captive screws located at top and bottom of ACU memory board 1A2A3.
5. Press extractor handles at top and bottom of ACU memory board 1A2A3 in opposite directions to release board and remove board from rack.
6. On underside of board using small flat-tipped screwdriver, remove three screws and flat washers securing front panel to board. Remove board from front panel.
7. IF THE ACU PROMS IN THE SYSTEM ARE 1.70 OR HIGHER PROCEED TO STEP 8, OTHERWISE CONTINUE WITH STEP 7.

Remove battery jumper J22 from ACU memory card. Jumper will be reinstalled during installation procedure.

CAUTION

Throughout this procedure, discharge screwdriver before and during use by touching tool to grounded chassis surface. Failure to comply may result in damage to integrated circuits.

Table 1 (continued)

CAUTION

Lift integrated circuit as evenly as possible. Failure to comply may result in damage to integrated circuits.

8. From front of board, slide small flat-tipped screwdriver between integrated circuit U7 and its IC socket. Carefully pry up on U7 to lift it from socket as evenly as possible. Remove U7 from socket and place in conductive foam or on some other static-free surface.
9. Repeat Step 8 for the following integrated circuits: U21, U8, and U17.

INSTALLATION

Tools Required: IC insertion tool
Small flat-tipped screwdriver

<u>Step</u>	<u>Procedure</u>
-------------	------------------

1. Verify that printer is off-line.

CAUTION

Damage to equipment may result if power is not removed prior to removal or installation. Ensure that OUTPUT POWER switch is set to 0 (off) and facility power is removed.

To avoid damage to circuit boards and Integrated circuits, use proper ESD handling procedures, including the use of a grounding strap when performing the following steps.

2. Verify that OUTPUT POWER switch on UPS status panel is set to 0 (off) position and OUTPUT indicator on status panel is extinguished.
3. Verify that facility power is removed from ACU cabinet.

CAUTION

Throughout this procedure, discharge IC insertion tool before and during use by touching tool to grounded chassis surface. Failure to comply may result in damage to integrated circuits.

4. Using IC insertion tool, remove new EPROM integrated circuits from protective packaging and insert into ACU memory board sockets in accordance with the following chart. Ensure that EPROMs are installed with pin 1 (as identified by notch in top of IC) oriented toward board connector P1 as shown on Figure 1.

Table 1 (continued)

IC socket	IC part number
U8	62828-45002-1
U17	62828-45003-1
U7	62828-45004-1
U21	62828-45005-1

5. Using a small flat-tipped screwdriver, install three flat washers and screws securing front panel to board.
6. Holding ACU memory board by handles, position board with component side to the right and carefully slide board into card rack on its guides. Align board with rear connector and press into place.
7. Using small flat-tipped screwdriver, tighten captive screws located at top and bottom of board. This completes modification note 10. Complete modification notes 14 and 15 before going to step 8.
8. Apply facility power to ACU cabinet.
9. Set OUTPUT POWER switch to 1 (on) position.
10. Place printer on-line by pressing ON-LINE switch on printer front panel. ON-LINE indicator illuminates.
11. With power applied to ACU and OID and after a brief warmup delay, OID displays 1-minute display. If display is not being updated, press HELP key twice to refresh screen. The NEED SID AND AOMC PHONE message appears at top of screen.

If this does not occur, return to REMOVAL procedure, step 1. Follow the steps until the ACU memory board is removed. Ensure the ACU PROMs are installed correctly. Follow INSTALLATION procedures to replace the ACU memory board. If the system is still not functioning correctly, contact Al Wissman at (301) 713-0260.
12. At OID, sign onto system as a technician.
13. Display external communications page on OID (sequentially press REVUE-SITE-CONFIG-EXTRN keys from 1-minute display). Enter phone number of AOMC (1-800-253-4717) into AOMC PHONE NUMBER field and press EXIT function key.
14. Display site physical page on OID (sequentially press REVUE-SITE-PHYS function keys from 1-minute display). Enter three or four character SID code in STATION IDENTIFIER field and press EXIT function key. The system then calls the AOMC and receives a download of site-specific data.

Table 1 (continued)

15. Display AOMC version page on OI D (sequentially press REVUE-SITE-VERSN-AOMC function keys from 1-minute display). This will allow you to observe that all the files are being downloaded from the AOMC. All status fields should read "COMPLETE" in approximately 5 minutes. Press EXIT.

NOTE: The following steps could start the DCPs.

16. Display maintenance page on OI D (press MAINT function key from 1-minute display).
17. Using PREV/NEXT keys, position cursor over PROC field and press SEL key. The OI D displays the processor status page.
18. Using PREV/NEXT keys, position cursor over DCP #1 - HARD field and press RESET key. Respond "YES" and "ENTER" to the "ARE YOU SURE?" message. The corresponding status field displays INITIALIZING while the unit is initializing. The progress of the download can be monitored by the PERCENT COMPLETE message that appears at the top of the screen.

When the percent complete reaches 100, the DCP status field changes to RUNNING.

19. If the system contains more than one DCP, repeat step 19 for DCPs #2 and #3 as required.

FINAL ACTIONS

1. After the FMK has been completed, clear any maintenance flags that occur as a result of the restart.
2. After the FMK has been completed, display the maintenance action page on OI D (sequentially press MAINT-ACT function keys from 1-minute display). Press FMK, enter the requested information. This will place a message in the SYSLOG indicating the type of maintenance performed. Additional information on the maintenance action function may be found in the Software User's Manual.
3. Display the SW version page on the OI D (sequentially press REVUE-SITE-VERSN-SW function keys from 1-minute display). The following fields should display version 2.1: MEMORY ACU APPLICATION EPROM, MEMORY DCP APPLICATION EPROM, and MEMORY DCP APPLICATION RAM. (These fields may take 5-10 minutes before they all read 2.1.)

At this point, the FMK is complete.

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Figure 1 is a detailed schematic diagram of an ACU memory board, showing the locations of EPROM chips. The board is populated with numerous integrated circuits (ICs) and other components. The ICs are labeled with part numbers such as U1, U2, U3, U4, U5, U6, U7, U8, U9, U10, U11, U12, U13, U14, U15, U16, U17, U18, U19, U20, U21, U22, U23, U24, U25, U26, U27, U28, U29, U30, U31, U32, U33, U34, U35, U36, U37, U38, U39, U40, U41, U42, U43, U44, U45, U46, U47, U48, U49, U50, U51, U52, and U53. Some of these chips are marked with an 'X'. The board also features various connectors, including P1 and P2, and other components like resistors and capacitors. The layout is organized into a grid-like structure, with components arranged in rows and columns. The diagram provides a clear visual representation of the board's architecture and the specific locations of the EPROM chips.

FIGURE 1. ACU MEMORY BOARD EPROM LOCATIONS

<u>EPROM DESIGNATOR</u>	<u>PART NUMBER</u>	<u>FUNCTION</u>
U8	62828-45002-1	BYTE 0
U17	62828-45003-1	BYTE 1
U7	62828-45004-1	BYTE 2
U21	62828-45005-1	BYTE 3

V 2.1 Software Sites

AAI/SMI shall provide software version 2.1 EPROMs and Field Modification Kits to the following locations.

Albany, NY (ALB)
Atlantic City, NJ (ACY)
Binghamton, NY (BGM)
Erie, PA (ERI)
Portland, ME (PWM)
Williamsport, PA (IPT)
Worcester, MA (ORH)
Detroit, MI (DTW)
Flint, MI (FNT)
Peoria, IL (PIA)
Rockford, IL (RFD)
Sioux City, IA (SUX)
Springfield, IL (SPI)
Spokane, WA (GEG)
Hanover, VA (W83)
St. Cloud, MN (STC)
Kansas City, MO (KCI)
Milwaukee, WI (MKE)
Sterling, VA (STO & ST1)
Silver Spring, MD (NWSH)

Operational Trouble Reports (OTR) Fixed in V2.1

OTR#	<u>TITLE/Summary</u>
064, 101, 237	<u>Spontaneous Warm Boots</u> - SMI has written software to flag all VME BUS errors in the code, so they can pinpoint where warm boots are occurring. The VME BUS error will tell the SMI programmers the last line of code executed before the warm boot occurred. SMI hopes this will help isolate the problem. This is not intended to solve the warm start problem; it is intended as a start to help them solve the problem. Field personnel will be requested to document the last steps that were performed before the warm boot occurred. This would include saving the SYSLOG, SAO's, OLD 1-minute screen, and the 12-hr archive data for the period just before the warm boot.
169	<u>Missing Wind Data Flags on Daily Summary</u> - Wind data continued to be updated on the daily summary page after report processing was turned off. The daily summary now reports "E" for estimated wind data.
195	<u>Incorrect Present Weather Remark</u> - The system generated improper remarks during intermittent LEDWI operation (e.g., SEMMB17SEMMB22SEMMB36SEMMB36SEMM PWINO). ASOS now simplifies the remark to SEMM PWINO.
225	<u>Rain Gauge Processing Deficiency</u> - ASOS continued to update precipitation parameters (24-hour precipitation and daily summary) after report processing was turned off. ASOS now ignores these tips.
227	<u>Incorrect Daily Weather Code on Daily Summary</u> - The daily summary code "X" for tornado was entered on the daily summary even though the USP for tornado was aborted. The USP must now be transmitted before the code is updated on the daily summary.
228	<u>Required CRs and LFs Not in SAO Text</u> - WMO requires that SAO text line not exceed 69 characters with a double carriage return/line feed. ASOS formerly split SAO text after the 78th character with a single carriage return/line feed. ASOS now conforms with the WMO spec.
235	<u>Pressure Sensor Status Deficiency</u> - The ACU Status screen reported Pressure "*" (indeterminant) while REVUE SENSOR STATUS reported "IPI" (pass). Both screens now report "*".

- 236 Missing "E" Prefix for Edited Wind 5-MIN OBS - The "E" prefix from 5MIN OBS wind report was missing after OBS EDIT. "E" now correctly shows up in 5MIN OBS.
- 246 Invalid Pressure Remark in SAO when Pressure Missing - After pressure sensors showed "M1", a PRESFR remark was still generated. The logic has been corrected.
- 252 20% Comms Fails Not Reported on 2nd Day - PHX experienced ACU/DCP Comms Fails >20% of the time for 2 days. The SYSLOG only reported failures on the first day. SYSLOG now reports COMMS failures at 0600 LST each day.
- 253 AOMC Display Page - Inaccurate Data/time in the Download Column - The time was inaccurate on the REVUE/SITE/VERSN/AOMC page after a download from AOMC. ASOS now downloads the SITE/PHYSICAL page first from AOMC. This corrects inaccurate data.
- 254 Improper Removal of TNO Remark - The TNO remark was being removed whenever communication was established with GS200 or ADAS. The TNO continues to appear when ADAS or GS-200 COMMS are established.
- 255 Invalid Temp Data Format on Monthly Summary - Observers were only able to enter integer values for the temperature departure from normal on the monthly summary page. Observers can now enter floating point data in this field.

Modifications Implemented in Version 2.1

- A. Multiple Sensor Algorithms - Meteorological Discontinuity and Backup Algorithms replaced the Early Warning and Area1 Algorithms. See Appendices C and D for detailed algorithm information.
- B. No Automatic Transmission of Urgent Special via GENOB - The prompt "DO YOU WANT TO TRANSMIT (Y OR N)" must be answered "Y" before transmission can begin (there is no default character).
- C. Rounding Temperatures - ASOS previously rounded all temperatures (positive and negative) up (i.e., -2.5 became -2.0) ASOS now rounds negative temperatures down.
- D. Rework Voicing of TNO, ZRNO, PWINO - New voicing is:

TNO - "Thunderstorm information not available"

ZRNO - "Freezing rain information not available"

PWINO - "Present weather information not available"
- E. SHEF Formatting - The onset/termination criteria have been added to the 15-min SHEF message.
- F. Freezing Rain Algorithm Changes - The Freezing Rain algorithm logic now interacts with the LEDWI to a much greater extent. See Appendix B for detailed algorithm information.
- G. Synoptic Maximum/Minimum Temperatures and 4 Group - The calculation of the daily maximum and minimum temperatures has been simplified. A 4 group for 24-hour calendar day maximum and minimum temperatures has also been added to the SAO remarks. See Appendix B for detailed algorithm information.
- H. Tower Visibility Remark - No tower visibility remark is included in the SAO when both tower and surface visibility are the same.
- I. AOMC Secondary Phone Number - This adds a secondary phone number for AOMC on the REVUE SITE COMMS EXTRL page, so ASOS sites have more than one phone line to dial AOMC for software uploads/downloads.
- J. Expand Present Weather Field for Volcanic Ash - The first line of the present weather field has been increased to 15 characters to allow entry of "VOLCANIC ASH".
- K. External Communications Page - AFOS site IDs are now displayed with the AFOS dial back-up phone numbers.
- L. Remote Pressure Sensor Capability - Pressure sensors can now be configured at the DCP for Navy sites in Antarctica.

- M. Dial Backup for Alaska and Hawaii - Provides backup via AFOS phone (port 1) for dial backup to the PRIME computer when link between ASOS and ADAS/GS-200 has been lost (if there have been no ADAS/GS-200 communications for 6 minutes).
- N. SHEF Formatting - Missing Data will be formatted with "M" instead of "MMM" as in previous versions.
- O. SHEF Back-up Dial Around -
- Separate AFOS addresses have been added for 15-min and 1-hr SHEF messages.
- If AFOS Hardwire is primary - If a valid response to the reply request is not received, a single additional attempt is made via AFOS phone.
- If AFOS Phone is primary - Retry attempts are identical to those for SAOs.
- ASOS systems with a hardwire connection to AFOS will now be able to transmit SHEF messages on the dial backup port with no ACK/NAK.
- P. Addition of Digits for ASOS-to-AOMC Phone Numbers - Additional digits have been added to accommodate auxiliary telephone systems at remote ASOS sites.
- Q- 1200-baud Flag for Alaska-AOMC Comms - Provide editable flag within AOMC phone number to set AOMC phone link to 1200 baud when Alaska sites dial AOMC.
- R. Major Rework of FAA Voice - There is now greater use of phrases rather than single words. Vocabulary has been added and more time is provided between observations.
- S. AFOS Port Sharing Device (PSD) - Allows use of a PSD at ASOS sites to communicate with AFOS using a Remote Terminal to AFOS (RTA) and Auxiliary Backup Terminal (ABT).
- T. GTA Radios - The maintenance screen now displays: transmit frequency, power level, power supply status, forward and reflected voltages, and ACU communications. The frequency and power level can be set from the OID (by the technician or system manager).
- U. UPS Replacement - The SOLA UPS is no longer in production and is being replaced by a Deltec UPS. Version 2.1 includes the ability to interface with either UPS.

Multiple Sensor Algorithms Meteorological Discontinuities

Sky Condition Report

1. Primary and met discontinuity sky condition reports are generated independently.
2. Primary sky condition report is **always** used in the official observation. Met discontinuity sky condition report is never used in the body of the observation.
3. Primary sky condition report and met discontinuity sky condition report are only compared when generating the remark (not the report). Amount stabilization and height stabilization processes are performed when constructing independent reports.
4. Primary sky condition report is not modified due to layers reported in the met discontinuity sky condition report.

Sky Condition Remark

1. The remark "LOC CHI NO" is generated if the met discontinuity sky condition report is missing.
2. Remarks "CIG VALUE LOC" and "CLDS LWR LOC" are generated based on comparison between the primary sky condition report and the met discontinuity sky condition report.
3. Variable ceiling remark ("CIG minVmax") or variable layer amount remark ("BKN V SCT", "BKN V OVC", or "OVC V BKN") generated based on layer heights and amounts in the official sky condition report.

Sky Condition Special Alert and Local Alert

Special Alerts and Local Alerts issued based on contents of primary sky condition report.

Visibility Report

1. Primary and met discontinuity visibility reports are generated independently.
2. Primary visibility report is **always** used in the official observation. Met discontinuity visibility report is never used in the body of the observation.

Visibility Remark

1. The remark "LOC VIS NO" is generated if the met discontinuity visibility report is missing.
2. The remark "VSBY VALUE LOC" is generated based on comparison between the primary visibility report and the met discontinuity visibility report.
3. Variable visibility remark may be generated using the 1-minute visibility values from the primary sensor only. Values from the met discontinuity sensor shall not be used to generate variable visibility

Visibility Special Alert and Local Alert

Special Alerts and Local Alerts issued based on contents of primary visibility report.

Multiple Sensor Algorithms Backup

Sky Condition Report

1. Primary and backup sky condition reports are generated independently.
2. Backup sky condition report used in the official observation only if the primary sky condition report is missing.
3. Primary sky condition report and backup sky condition report are only compared when generating the remark (not the report). Amount stabilization and height stabilization processes are performed when constructing independent reports.
4. There is no interaction between the primary sky condition report and the backup sky condition report.

Sky Condition Remark

1. No remark is generated if backup sky condition report is missing.
2. No remark generated based on comparison between the primary sky condition report and the backup sky condition report.
3. Variable ceiling remark ("CIA minVmax") or variable layer amount remark ("BKN V SCT", "BKN V OVC", or "OVC V BKN") generated based on layer heights and amounts in the official sky condition report.

Sky Condition Special Alert and Local Alert

Special Alerts and Local Alerts issued based on contents of the official observation.

Visibility Report

1. Primary and backup visibility reports generated independently.
2. Backup visibility report used in official observation if primary visibility sensor is inoperative.

Visibility Remark

Variable visibility remark ("VSBY minVmax") is generated based on 1-minute values from the primary sensor. If the primary sensor is inoperative, values from the backup sensor are used.

Visibility Special Alert and Local Alert

Special Alerts and Local Alerts issued based on contents of the official observation.

ADDENDUM TO ASOS MODIFICATION NOTE 10 (for Electronic Technicians)

Engineering Division

W/OS0321: BGM

GENERAL

This addendum provides instructions to EHB-11, section 3.6, ASOS Modification Note 10, issued April 8, 1994. The addendum provides additional information learned after the modification note was published.

PROCEDURE

1. On page 2, add the following information after the first sentence in step 7.

ADD :

Go into the AOMC page (REVUE-SITE-VERSION-AOMC); wait for the external comm and the site physical lines to change from "AUTO UPLOAD REQ" to "COMPLETE" before going to the next step.

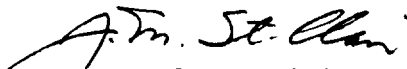
2. On page 3, add a new step 8a after step 8.

ADD:

Continue with Appendix A, Instructions for FMK-ASOS Software Version Upgrade. Once complete with the steps in Appendix A, continue with "After Installing Firmware," step 9.

EFFECT ON OTHER INSTRUCTIONS

None.



J. Michael St. Clair
Chief, Engineering Division

ASOS MODIFICATION NOTE 12 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM

SUBJECT : Installation of 9600-baud modem(s) Model V. 3225

PURPOSE : Increase transfer rate between OIDs and the ACU from 2400 to 9600 baud.

EQUIPMENT AFFECTED : Automated Surface Observing System (ASOS)

PARTS REQUIRED : Reference parts listed in the attached Field Modification Kit (FMK) #048

MOD PROCUREMENT : The above parts will be provided by the NLSC as ASOS S100-FMK048. No action is required by the station.

SPECIAL TOOLS : None
REQUIRED

TIME REQUIRED : 1 hour

EFFECT ON OTHER : None
INSTRUCTIONS

CERTIFICATION : This modification is authorized by Engineering Change
STATEMENT Proposal E92SM05F038. It was tested by the
Engineering Division at Silver Spring, MD.

GENERAL

This modification note provides instructions for replacing the model 2440 modems in the ACU with a model V. 3225, 9600-baud modem. Refer to the ASOS Site Technical Manual, Chapter IV (Theory), pages 2-70 through 2-76. The pages are part of change 1 for the ASOS Site Technical Manual.

A separate modification kit is required for each 2400-baud secondary OID. Secondary OID-3 references are shown in parentheses. The installation for a system with two secondary OIDs can be accomplished in parallel or in series.

PROCEDURE

Instructions are provided in FMK #048 for installation of the model V. 3225 9600-baud modem. Notify the AOMC before starting the modification.

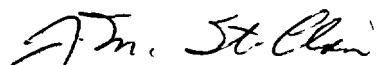
REPORTING MODIFICATION

Target date for completing this modification is 45 days after receipt of FMK. Report completed modification on WS Form H-28, Engineering Progress Report, per instructions in EHB-4, part 2, using reporting code ASOS.

Make appropriate entries in the SYSLOG using the Maintenance Action keys, Field Modification keys, and comment fields. Follow these steps:

1. Log On as TECH.
2. Key the MAINT screen.
3. Key the ACTION page.
4. Key START - Stop here and perform the modification.
After FMK-048 is complete, log on system.
5. Key the MAINT screen.
6. Key the ACTION page.
7. Key FMK - Enter the FMK number as follows: FMK048
On the second line of the screen verify that only FMK048 is displayed.
Complete by entering 1 in the Y/N if only FMK048 is displayed.
8. Check the SYSLOG and verify the FMK message. Notify the AOMC via telephone that FMK 048 is complete.

Return all replaced parts as S100-FMK0480LD. This should include the 2400 Baud stand-alone and rack mount modems, S100-10-1 and S100-1A3A1. NRC will test, verify, and restock each item returned.



J. Michael St. Clair
Chief, Engineering Division

Attachment

SID _____

FMK #048

ASOS FIELD MOD KIT (FMK)

CONTRACT 50-SANW-1-00050

AAI SYSTEMS MANAGEMENT INC.
11101 GILROY ROAD
HUNT VALLEY, MD 21030-1108

Date Prepared: 12/07/93 Task Order/ECP: E92SM05F038

Part Numbers Affected: 62828-40044 ACU CABINET
62828-40000 ASOS Top Level

Documentation Included: 9600-BAUD MODEM INSTALLATION INSTRUCTIONS

Description of Change: The FMK replaces the 2400-baud modems in the ACU with a model V.3225 9600-baud modem.

Parts Included: SEE ATTACHED PARTS LIST

QA Concurrence With FMK: _____

9600-BAUD MODEM FIELD MOD. KIT

PARTS REQUIRED:

PART NUMBER	QTY.	NOMENCLATURE
1. 62828-42043-10	2 ea.	Cable & Adapter, 9600 baud
2. 62828-90044-2	1 ea.	Adapter, Modem
3. 62838-90048-1	1 ea.	Modem, Model V. 3225 Rack
4. 62828-90050-1	1 ea.	Modem, Model V. 3225 Standalone

PROCEDURE:

NOTE: This FMK is for systems that have either or both SECONDARY OI D-2 and SECONDARY OI D-3 configured for leased line operation. SECONDARY OI D-3 references are shown in parentheses.

1. Remove power from ACU. Set 1A4A1S1 power switch to the 0 (OFF) position. (Class II systems only)
2. Remove facility power from ACU by unplugging the power cord.
3. Remove model 2440 modem from modem rack slot 1A3A2 (1A3A3).
4. Disconnect SIO and W14P73 (W14P74) cables from rear of 1A3A2 (1A3A3).
5. Remove modem adapter segment from 1A3A2 (1A3A3).
6. Install modem adapter segment (P/N 62828-90044-2) in slot 1A3A2 (1A3A3).
7. Reconnect SIO cable to 1A3A2 (1A3A3).
8. Install 9600-baud modem adapter cable (P/N 62828-42043-10), J1 end to W14P73 (W14P74). Connect P1 end to 1A3A2 (1A3A3) TELSET/LL (top TELCO connector).
9. Install modem (P/N 62828-90048-1) in slot 1A3A2 (1A3A3) of ACU. Restore facility power to ACU.
11. Apply power to ACU. Set 1A4A1S1 power switch to the 1 (ON) position. (Class II systems only)

NOTE: PERFORM STEP 12 ONLY IF FIRMWARE REV. 2.1 OR HIGHER HAS NOT BEEN INSTALLED IN THE ACU MEMORY BOARD.

12. Configure modems in slots 1A3A2 (1A3A3) using display and pushbuttons on front panel of modem to perform the following:

	<u>DISPLAY READS</u>	<u>PRESS</u>
A.	LOADS FACTORY OPTION SET #1	
1.	V. 32 9600/IDLE	NO
2.	DIAL STORED NUMBER?	NO
3.	DISPLAY STATUS?	NO
4.	SELECT TEST?	NO
5.	MODIFY CONFIGURATION?	YES
6.	CHANGE MODEM OPTIONS?	TALK/DATA
7.	LOAD OR STORE OPTION SET?	YES
8.	LOAD FACTORY OPTION SET?	YES
9.	ARE YOU SURE?	YES
10.	LOAD FACTORY OPTION SET X1?	YES
11.	STORE PRESENT OPTIONS?	NO

12.	LOAD OR STORE OPTION SET?	NO	
13.	MODIFY CONFIGURATION?	YES	
B.	ORIGINATE OR FORCED ANSWER SETUP		
14.	CHANGE MODEM OPTIONS?	YES	
15.	DCE RATE IS 9600 TRELLIS. CHANGE?	NO	
16.	NORMAL ORIGINAL/FORCED ANSWER?		
17.	V.32 FAST TRAIN DISABLED. CHANGE?	NO	
18.	AUTO RETRAIN ENABLED. CHANGE?	NO	
19.	INTERNAL CLOCK. CHANGE?	NO	
C.	LEASED LINE SETUP		
20.	DIAL LINE CHANGE TO LEASE?	YES	
21.	LEASED LINE CHANGE TO DIAL?	TALK/DATA	<u>No</u>
22.	CHANGE MODEM OPTIONS?	NO	
23.	CHANGE MNP OPTIONS?	YES	22 Two wire to
24.	MNP PROTOCOL ENABLED. CHANGE?	NO	Four wire. Answer
25.	AUTO FALLBACK TO NORMAL. CHANGE?	NO	
26.	FLOW CONTROL IS XON/XOFF. CHANGE?	YES	Four wire
27.	CHANGE TO UNILATERAL CTS?	NO	1/2 NO
28.	CHANGE TO RTS/CTS?	NO	
29.	CHANGE TO DISABLED?	YES	600 baud
30.	FLOW IS DISABLED. CHANGE?	NO	
31.	XON/XOFF PASS THRU DISABLED. CHANGE?	TALK/DATA	
32.	CHANGE MNP OPTIONS?	NO	
33.	CHANGE DTE OPTIONS?	YES	
34.	ASYNC DATA CHANGE TO SYNC?	NO	
35.	DTE RATE IS 9600. CHANGE?	NO	
36.	8 BIT CHAR SIZE CHANGE TO 7?	NO	
37.	NO PARITY CHANGE?	NO	
D.	DISABLE "AT" COMMANDS		
38.	"AT" COMMAND SET ENABLED, CHANGE?	YES	
39.	"AT" COMMAND SET DISABLED, CHANGE?	NO	
40.	IGNORES DTR CHANGE?	NO	
41.	DSR FORCED HIGH CHANGE?	NO	
42.	DCD FORCED HIGH CHANGE?	YES	
43.	CHANGE TO DCD FROM REMOTE?	YES	
44.	DCD IS REMOTE CHANGE?	NO	
45.	CTS FORCED HIGH CHANGE?	YES	
46.	CHANGE TO CTS FOLLOWS RTS?	NO	
47.	CHANGE TO CTS EQUALS RTS?	NO	
48.	CHANGE TO CTS FOLLOWS DCD?	YES	
49.	CTS FOLLOWS DCD CHANGE?	TALK/DATA	
50.	CHANGE DTE OPTIONS?	TALK/DATA	
E.	STORE PRESENT SETUP		
51.	LOAD OR STORE OPTION SET?	YES	
52.	LOAD FACTORY OPTION SET?	NO	
53.	STORE PRESENT OPTIONS?	YES	
54.	ARE YOU SURE?	YES	
55.	OPTIONS ARE NOW PERMANENT (displayed for 2 seconds, then)		
	MODIFY CONFIGURATION?	TALK/DATA	
	V.32 9600/TRAINING		

factory set
(x)

22 Two wire to
Four wire. Answer
Four wire
1/2 NO
600 baud

13. Sign on OI D as a TECHNICIAN and press REVUE-SITE-CONFIG-COMMS.
14. Move cursor to OI D-2 (OI D-3) SECONDARY. Press CHANG and set up port as follows:

FUNCTION OI D-2 (OI D-3) SECONDARY			
STATUS	ENABLED	HANDSHAKE	NONE
BAUD RATE	9600	CONNECTION	LEASED
PARITY SELECT	NONE	MODEM SLOT	2
BITS/CHAR	8	DIAL TYPE	TONE
STOP BITS	1		

Exit COMMS page.

15. At OI D-2 (OI D-3) SECONDARY location, disconnect 2440 standalone modem (P/N 62628-90046-1) and cables. Install V. 3225 standalone Modem (P/N 62628-90050-1). Reinstall cable between modem and OI D. Install 9600-baud modem adapter cable (P/N 62828-42043-10), J1 end to leased line, P1 end to TELSET/LEASED LINE jack of modem.
16. Turn power on modem.
17. Set up modem parameters using display and pushbuttons on front panel of modem to perform the following:

	<u>DISPLAY READS</u>	<u>PRESS</u>
A.	LOADS FACTORY OPTION SET #1	
1.	V. 32 9600/IDLE	NO
2.	DIAL STORED NUMBER ?	NO
3.	DISPLAY STATUS ?	NO
4.	SELECT TEST ?	NO
5.	MODIFY CONFIGURATION?	YES
6.	CHANGE MODEM OPTIONS?	TALK/DATA
7.	LOAD OR STORE OPTION SET ?	YES
8.	LOAD FACTORY OPTION SET ?	YES
9.	ARE YOU SURE?	YES
10.	LOAD FACTORY OPTION SET XI ?	YES
11.	STORE PRESENT OPTIONS ?	NO
12.	LOAD OR STORE OPTION SET?	NO
13.	MODIFY CONFIGURATION ?	YES
B.	ORIGINATE OR FORCED ANSWER SETUP	
14.	CHANGE MODEM OPTIONS?	YES
15.	DCE RATE IS 9600 TRELLIS.CHANGE?	NO
16.	NORMAL ORIGINATE/FORCED ANSWER?	YES
17.	FORCED ANSWER/NORMAL ORIGINATE?	NO
18.	V. 32 FAST TRIM DISABLED. CHANGE?	NO
19.	AUTO RETRAIN ENABLED, CHANGE?	NO
20.	INTERNAL CLOCK, CHANGE ?	NO
C.	LEASED LINE SETUP	
21.	DIAL LINE CHANGE TO LEASE ?	YES
22.	LEASED LINE CHANGE TO DIAL?	TALK/DATA
23.	CHANGE MODEM OPTIONS?	NO
24.	CHANGE MNP OPTIONS?	YES
25.	MNP PROTOCOL ENABLED. CHANGE?	NO
26.	AUTO FALLBACK TO NORMAL, CHANGE?	NO
27.	FLOW CONTROL IS XON/XOFF. CHANGE?	YES

28.	CHANGE TO UNILATERAL CTS?	NO
29.	CHANGE TO RTS/CTS?	NO
30.	CHANGE TO DISABLED?	YES
31.	FLOW IS DISABLED, CHANGE?	NO
32.	XON/XOFF PASS THRU DISABLED CHANGE?	TALK/DATA
33.	CHANGE MNP OPTIONS?	NO
34.	CHANGE DTE OPTIONS	YES
35.	ASYNC DATA CHANGE TO SYNC?	NO
36.	DTE RATE IS 9600, CHANGE?	NO
37.	8 BIT CHAR SIZE CHANGE TO 7?	NO
38.	NO PARITY CHANGE?	NO
D.	DISABLE "AT" COMMANDS	
39.	"AT" COMMAND SET ENABLE, CHANGE?	YES
40.	"AT" COMMAND SET DISABLE, CHANGE?	NO
41.	IGNORES DTR CHANGE?	NO
42.	DSR FORCED HIGH CHANGE?	YES
43.	CHANGE TO DCD FROM REMOTE?	YES
44.	DCD IS REMOTE CHANGE?	NO
45.	DCD FORCED HIGH CHANGE?	NO
46.	CTS FORCED HIGH CHANGE?	YES
47.	CHANGE TO CTS FOLLOWS RTS?	NO
48.	CHANGE TO CTS EQUALS RTS?	NO
49.	CHANGE TO CTS FOLLOWS DCD?	YES
50.	CTS FOLLOWS DOD CHANGE?	TALK/DATA
51.	CHANGE DTE OPTIONS?	TALK/DATA
E.	STORE PRESENT SETUP	
52.	LOAD OR STORE OPTION SET?	YES
53.	LOAD FACTORY OPTION SET?	NO
54.	STORE PRESENT OPTIONS?	YES
55.	ARE YOU SURE?	YES
56.	OPTIONS ARE NOW PERMANENT (displayed for 2 seconds, then)	
	MODIFY CONFIGURATION?	TALK/DATA
	V.32 9600/TRAINING	

NOTE: Display will read TRAINING until modems connect, then display will change to ON LINE.

18. On OI D-2 (OI D-3) change baud rate from 2400 to 9600. Press SET UP (F3). Move cursor using arrow keys to PORT. Move cursor down to PORT A SETTINGS. Press <ENTER>. Move cursor down to TRANSMIT BAUD RATE. Press <ENTER> until 9600 is selected. Press <SHIFT> <UP ARROW>. Move cursor to EXIT. Select EXIT AND SAVE CHANGES and press <ENTER>. Answer Yes to question. OI D will be communicating with ACU.

(end of procedure)

28.	CHANGE TO UNILATERAL CTS?	NO
29.	CHANGE TO RTS/CTS?	NO
30.	CHANGE TO DISABLED?	YES
31.	FLOW IS DISABLED, CHANGE?	NO
32.	XON/XOFF PASS THRU DISABLED CHANGE?	TALK/DATA
33.	CHANGE MNP OPTIONS?	NO
34.	CHANGE DTE OPTIONS	YES
35.	ASYNC DATA CHANGE TO SYNC?	NO
36.	DTE RATE IS 9600, CHANGE?	NO
37.	8 BIT CHAR SIZE CHANGE TO 7?	NO
38.	NO PARITY CHANGE?	NO
D.	DISABLE "AT" COMMANDS	
39.	"AT" COMMAND SET ENABLE, CHANGE?	*YES
40.	"AT" COMMAND SET DISABLE, CHANGE?	NO
41.	IGNORES DTR CHANGE?	NO
42.	DSR FORCED HIGH CHANGE?	YES
43.	CHANGE TO DCD FROM REMOTE?	YES
44.	DCD FORCED HIGH CHANGE?	YES
45.	DCD IS REMOTE CHANGE?	NO
46.	CTS FORCED HIGH CHANGE?	YES
47.	CHANGE TO CTS FOLLOWS RTS?	NO
48.	CHANGE TO CTS EQUALS RTS?	NO
49.	CHANGE TO CTS FOLLOWS DCD?	YES
50.	CTS FOLLOWS DOD CHANGE?	TALK/DATA
51.	CHANGE DTE OPTIONS?	TALK/DATA
E.	STORE PRESENT SETUP	
52.	LOAD OR STORE OPTION SET?	YES
53.	LOAD FACTORY OPTION SET?	NO
54.	STORE PRESENT OPTIONS?	YES
55.	ARE YOU SURE? YES	
56.	OPTIONS ARE NOW PERMANENT (displayed for 2 seconds, then)	
	MODIFY CONFIGURATION?	TALK/DATA
	V. 32 9600/TRAINING	

NOTE: Display will read TRAINING until modems connect, then display will change to ON LINE.

18. On OID-2 (OID-3) change baud rate from 2400 to 9600. Press SET UP (F3). Move cursor using arrow keys to PORT. Move cursor down to PORT A SETTINGS. Press <ENTER>. Move cursor down to TRANSMIT BAUD RATE. Press <ENTER> until 9600 is selected. Press <SHIFT> <UP ARROW>. Move cursor to EXIT. Select EXIT AND SAVE CHANGES and press <ENTER>. Answer Yes to question. OID will be communicating with ACU.

(end of procedure)

ASOS ERRATA SHEET 1 (for Electronics Technicians)

Engineering Division

W/OSO321: BGM

Replacement Page for ASOS Modification Note 12

GENERAL

This errata sheet provides instructions to correct A-5 of ASOS Modification Note 12. The reason for the change is to correct parameters located on page A-5, item D, DISABLE "AT" COMMANDS, lines 42 and 45. Line 42 was changed from YES to NO. Line 45 was moved and renumbered as line 43 and the NO was changed to YES. The original line 43 was renumbered as line 44. The original line 44 was renumbered as line 45.

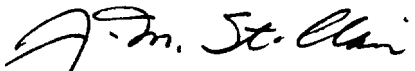
A corrected page A-5 is provided with this errata sheet. The areas where corrections were made are highlighted.

PROCEDURE

1. Remove page A-5 of ASOS Modification Note 12 and replace with corrected page attached to this errata sheet.

EFFECT ON OTHER INSTRUCTIONS

Replaces page A-5 of EHB-11, Section 3.6, ASOS Modification Note 12, issued March 15, 1994.



J. Michael St. Clair
Chief, Engineering Division

Attachment

Replacement Page for ASOS Modification Note 12

GENERAL

This errata sheet provides instructions to correct ASOS Modification Note 12. The reason for the change is to correct parameters located on page A-5, item D, DISABLE "AT" COMMANDS, lines 42 and 44, Line 42 was changed from NO to YES. Line 43 was moved and renumbered as line 44 and the NO was changed to YES. The original line 44 was renumbered as line 43.

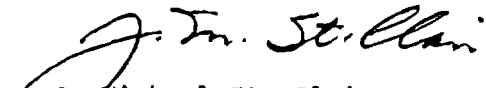
A corrected page A-5 is provided with this errata sheet, The areas where corrections were made are highlighted.

PROCEDURE

1. Remove page A-5 of ASOS Modification Note 12 and replace with corrected page attached to this errata sheet.

EFFECT ON OTHER INSTRUCTIONS

Replaces errata sheet 1, page A-5 of EHB-11, Section 3.6, ASOS Modification Note 12, issued March 17, 1994.



J. Michael St. Clair
Chief, Engineering Division

Attachment

- | | | |
|--------------------------|-----------------------------------------------------------|-----------|
| 28. | CHANGE TO UNILATERAL CTS? | NO |
| 29. | CHANGE TO RTS/CTS? | NO |
| 30. | CHANGE TO DISABLED? | YES |
| 31. | FLOW IS DISABLED, CHANGE? | NO |
| 32. | XON/XOFF PASS THRU DISABLED CHANGE? | TALK/DATA |
| 33. | CHANGE MNP OPTIONS? | NO |
| 34. | CHANGE DTE OPTIONS | YES |
| 35. | ASYNC DATA CHANGE TO SYNC? | NO |
| 36. | DTE RATE IS 9600, CHANGE? | NO |
| 37. | 8 BIT CHAR SIZE CHANGE TO 7? | NO |
| 38. | NO PARITY CHANGE? | NO |
| D. DISABLE "AT" COMMANDS | | |
| 39. | "AT" COMMAND SET ENABLE, CHANGE? | YES |
| 40. | "AT" COMMAND SET DISABLE, CHANGE? | NO |
| 41. | IGNORES DTR CHANGE? | NO |
| 42. | DSR FORCED HIGH CHANGE? | NO |
| 43. | DCD FORCED HIGH CHANGE? | YES |
| 44. | CHANGE TO DCD FROM REMOTE? | YES |
| 45. | DCD IS REMOTE CHANGE? | NO |
| 46. | CTS FORCED HIGH CHANGE? | YES |
| 47. | CHANGE TO CTS FOLLOWS RTS? | NO |
| 48. | CHANGE TO CTS EQUALS RTS? | NO |
| 49. | CHANGE TO CTS FOLLOWS DCD? | YES |
| 50. | CTS FOLLOWS DOD CHANGE? | TALK/DATA |
| | CHANGE DTE OPTIONS? | TALK/DATA |
| E. STORE PRESENT SETUP | | |
| 52. | LOAD OR STORE OPTION SET? | YES |
| 53. | LOAD FACTORY OPTION SET? | NO |
| 54. | STORE PRESENT OPTIONS? | YES |
| 55. | ARE YOU SURE? | YES |
| 56. | OPTIONS ARE NOW PERMANENT (displayed for 2 seconds, then) | |
| | MODIFY CONFIGURATION? | TALK/DATA |
| | V. 32 9600/TRAINING | |

NOTE: Display will read TRAINING until modems connect, then display will change to ON LINE.

18. On OID-2 (OID-3) change baud rate from 2400 to 9600. Press SET UP (F3). Move cursor using arrow keys to PORT. Move cursor down to PORT A SETTINGS. Press <ENTER>. Move cursor down to TRANSMIT BAUD RATE. Press <ENTER> until 9600 is selected, Press <SHIFT> <UP ARROW>. Move cursor to EXIT. Select EXIT AND SAVE CHANGES and press <ENTER>. Answer Yes to question. OID will be communicating with ACU.

(end of procedure)

ASOS MODIFICATION NOTE 13 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM

SUBJECT : Replacing EPROM on Visibility Processor Board and Installing Visibility **Crossarm** Cable Guides

PURPOSE : To solve the heater diagnostic problem. The new firmware contains commands that instructs the operator on how to enable and calibrate the heater current. Cable guides are added to restrain the cables from snagging and contacting the transmitter and receiver canisters.

EQUIPMENT AFFECTED : Automated Surface Observing System (ASOS)

PARTS REQUIRED : Parts listed in the installation instructions.

MOD PROCUREMENT : Parts will be provided by the NLSC as ASOS S100-FMK029-42. No action is required by the station.

SPECIAL TOOLS REQUIRED : None

TIME REQUIRED : 2 hours

EFFECT ON OTHER INSTRUCTIONS : None

CERTIFICATION STATEMENT : This modification is authorized by Engineering Change Proposals E92SM05F054 and E93SM05F086. It was tested by the Engineering Division at Silver Spring, MD.

GENERAL

This modification note provides instructions for replacing the EPROM on the visibility sensor processor board. This change adds visibility heater diagnostic status to the maintenance screen. The updated firmware is intended to indicate visibility heater failure. The EPROM on the visibility processor board changes from version 034 to 036.

The modification also provides instructions for installing two stainless steel cable guides in the visibility sensor **crossarm** assembly. The guides provide strain relief and keep the cable from snagging during insertion and removal of the transmitter and receiver canisters. The modification also provides the instructions for checking the soldering of the heater wire in the visibility transmitter and receiver canisters.

PROCEDURE

FMK #029 provides instructions for installing the EPROM (U2) version 036 on the visibility processor board. FMK #42 provides installation instructions for the stainless steel cable guides. Notify the AOMC before starting the modification.

BEFORE INSTALLING FIRMWARE

1. Call the AOMC at 1-800-242-8194. Inform the person who answers the phone at which office you will be installing new firmware.
2. For commissioned sites, get approval of the responsible MIC/OIC before starting installation. For non-commissioned sites, the el tech must coordinate with the site MIC/OIC before starting installation. You may install on any day of the month if permission is granted and the restrictions in steps 3 and 4 are complied with.
3. Commissioned Sites Only: Do not start installation during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of those conditions is expected within 3 hours. These meteorological conditions will be defined by the responsible MIC/OIC.
4. Do not start firmware installation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z.
5. Immediately before beginning work at NWS staffed sites, the MIC/OIC/Observer will inform the tower and any other critical users that ASOS visibility sensor will be shut off for firmware upgrade (unstaffed sites, the el tech will inform tower).
6. Do not begin the installation process until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.
7. The system voice function will automatically broadcast visibility missing message when the visibility power is turned off.
8. Make the appropriate SYSLOG entries (MAINT-ACT-FMK) #029 and #042.

AFTER INSTALLING FIRMWARE

9. When visibility is restarted at unstaffed sites, call to inform towers using CVDs and OIDs that the work is complete. (At staffed sites, the MIC/OIC observer will call the tower).
10. If on-site NWS staff provides backup while the installation is underway, no special observation is needed when ASOS is restarted. Proceed to step 11.

11. Inform office staff that ASOS is again operational. The chart below indicates how long it takes after start up for ASOS to report each observation element automatically.

Times Needed for Elements to be Reported Automatically

	<u>Minimum</u>	<u>Maximum</u>
Pressure	60 seconds	10 minutes
Precipitation Amount	60 seconds	*
Wind direction	2 minutes	7 minutes
Wind speed	2 minutes	7 minutes
Precipitation Type	2 minutes	*
Temperature	5 minutes	10 minutes
Dew Point	5 minutes	10 minutes
Visibility	10 minutes	15 minutes
Obstruction to Visibility	10 minutes	*
Ceiling	30 minutes	35 minutes

* Maximum time not applicable since phenomena may not be present.
Minimum time applies if phenomena are present.

12. Verify that ASOS transmitted an hourly observation. Call the AOMC at 1-800-242-8194 and tell the operator:
 - a. Your location,
 - b. That installation of the new firmware has been completed, and
 - c. That ASOS is operational.
13. Enter in the SYSLOG that maintenance has been completed.
14. At an expansion site with ATCT, the el tech will contact ATCT and supply information on the following:
 - a. ASOS maintenance completed,
 - b. ASOS visibility has been restored to service.

VISIBILITY HEAD INSPECTION

See ASOS Site Manual S-100 for removal and installation procedures for the Visibility Receiver (table 6.5.7) and Transmitter (table 6.5.8).

With the Receiver and Transmitter canisters removed from the sensor head, the procedure to inspect for proper solder connection of the internal heater wiring is the same for both units.

1. Use a #1 Phillips screwdriver to remove the three screws located approximately 2.5 inches from the connector end and at approximately 120 degree intervals around the canister.

NOTE: BE EXTREMELY CAREFUL as the internal portion of the canister will freely slide out toward the lens end with these screws removed. Do not allow the optic end of the canister to impact on the work surface.

2. Locate the gold colored heater resistor attached to the rod that runs the length of the canister above the circuit board.
3. Gently tug on both ends of the wires that connect the gold resistor to the circuit board to ensure that the connections are securely soldered and not merely pushed into the terminations. If a loose connection is found, replace the canister.
4. Reverse the disassembly procedure to reassemble the canister. The three retaining screws will only line up with the case in one position. Simply rotate the housing around the internal portion until all screw holes are visible.
5. When it has been verified that the heater wiring is properly soldered, place a small dot of red nail polish near the DB9 connector on the end of the canister to indicate that the unit has been checked and verified.

NOTE: Clean lenses before placing canisters back into sensor head.

REPORTING MODIFICATION

Target date for completing this modification is 90 days after receipt of parts. Report completed modification on WS Form H-28, Engineering Progress Report, per instructions in EHB-4, part 2, using reporting code ASOS.

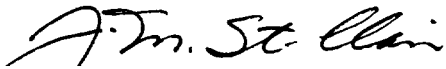
Make appropriate entries in the SYSLOG using the Maintenance Action keys, Field Modification keys, and comment fields. Follow these steps:

1. Log on as TECH.
2. Key the MAINT screen.
3. Key the ACTION page.
4. Key START - Stop here and perform the modification FMK-029. After FMK-029 is complete, log on system.
5. Key the MAINT screen.
6. Key the ACTION page.
7. Key FMK - Enter the Field Mod Kit (FMK) number as follows: FMK029
On the second line of the screen verify that only FMK029 is displayed. Complete by entering 1 in the Y/N if only FMK029 is displayed.
8. Check the SYSLOG and verify the FMK message.
9. Repeat steps 7 and 8, using FMK42 in place of FMK029. Notify the AOMC via telephone that FMKs 029 and 42 are complete.

NOTE:

Visibility canisters that do not have soldered wires should be returned to NRC for repair.

Unused parts should be returned to NRC as S100-FMK-029.0LD
This should include the visibility EPROM, NRC will reprogram for other applications.

A handwritten signature in black ink, reading "J. Michael St. Clair". The signature is written in a cursive, flowing style.

J. Michael St. Clair
Chief, Engineering Division

Attachments

INSTRUCTIONS

FIELD MODIFICATION KIT - ASOS SOFTWARE VERSION UPGRADE

1.0 UPGRADING ASOS SOFTWARE

1.1 GENERAL

The EPROM on the visibility processor board changes from version 034 to 036. This change is accomplished by replacing the EPROM with the new version EPROM. The old EPROM must be returned to NRC with this completed form so reprogramming and reissuance can occur. Refer to the attached instructions to accomplish the modification.

1.2 SOFTWARE UPGRADE PROCEDURE

Table 1 provides the procedure to remove and install the visibility firmware by removing and replacing EPROM U2. Figure 2 illustrates the location of the EPROM U2. After completion of the firmware upgrade procedure, the EPROM removed from the visibility processor board should be packaged in appropriate electrostatic discharge protective material for return to NRC.

NOTE: There may be an approximate 15-minute wait required to access the AOMC.

Table 1. Replacing Visibility Firmware

Step	Procedure
<p>VISIBILITY SENSOR FIRMWARE REMOVAL AND REPLACEMENT PROCEDURE</p> <p>Tools Required: Large flat-tipped screwdriver No. 1 Phillips screwdriver</p> <p><u>WARNING</u></p> <p>Death or severe injury may result if power is not removed from sensor before performing maintenance activities.</p> <ol style="list-style-type: none"> 1. Coordinate with site observer, if applicable, and make an entry in the SYSLOG. 2. At the DCP cabinet, set the visibility sensor circuit breaker module to OFF (right) position. 3. Using large flat-tipped screwdriver, open visibility sensor electronics enclosure access door and locate the processor board A1A1 (P/N 32194-1). Using Phillips screwdriver, remove captive screw securing processor board to standoff. This screw is on the bottom side of the board. See figures 1 and 2. 4. Carefully remove processor board by pulling it free from backplane connector XA1. 5. Using the drawing supplied, locate microcircuit U2. If version number is 034 or lower, remove U2. 6. Install supplied version 036 microcircuit, using care to match the index notch with the notch in the chip socket. Press firmly into socket. 7. Install processor board into backplane connector XA1. 8. Using Phillips screwdriver, install screw securing processor board to standoff. 9. Perform the Visibility Sensor Heater Calibration Procedure (attached) starting at step 3.5 and continuing through step 6.7. 10. Using large flat-tipped screwdriver, close visibility sensor electronics enclosure access door. 11. At the DCP cabinet, set the visibility sensor circuit breaker module to ON (left) position. 	

NOTE: Calibration of visibility sensor is not required.

Table 1. (continued)

12. Coordinate with site observer, if applicable, and clear any maintenance flags generated, making an entry in the SYSLOG.
13. Return signed front page of FMK, along with version 034 EPROM, to NRC.

VISIBILITY SENSOR HEATER CALIBRATION PROCEDURE

1. INTRODUCTION

Use this procedure when installing firmware containing changes to solve the heater diagnostic problem. The new firmware contains a command "V3" which instructs the operator to "calibrate the heater current readings." The "V3", command tells the operator exactly how to enable the firmware to measure the actual current drawn by each of the heaters. There are no special fixtures needed to perform "V3", and it does not matter if the sensor is in 'ASOS mode" or not.

Calibration procedures 4 and 5 must be run any time the visibility crossarm, transmit canister, receiver canister, or day/night sensor are replaced.

2. TOOLS AND EQUIPMENT

PC with Procomm Plus or equivalent software
RS232 adapter cables
Digital Multimeter (DMM)
Jumper for the contacts of J7 connector on backplane
Small flat-tipped screwdriver

3. SETUP PROCEDURE

- 3.1 At the DCP, locate the circuit breaker for the visibility sensor and switch to the OFF position.
- 3.2 At the visibility sensor, remove hinge pin and lower sensor.
- 3.3 Open the electronics enclosure. Locate U2 on the processor board and remove the microcircuit using standard ESD precautions. See figure 2.
- 3.4 Install the new microcircuit supplied into U2 socket, assuring that pin 1 of the microcircuit matches pin 1 of the socket.
- 3.5 Disconnect the DB-9 cable connector from the fiber optic modem on top of the Faraday box.
- 3.6 Connect the PC to the DB-9 cable connector in the electronics enclosure. Set the PC to "2400, N, 8, 1" with CAPS LOCK to establish the correct communications protocol with the sensor.

Table 1. (continued)

- 3.7 At the DCP, turn the visibility sensor circuit breaker to ON.
- 3.8 Verify that the PC displays the sensor initialization message shown below.

*** VIS VER XXX - 6220 ***

The "XXX" refers to the sensor firmware version number and the "6220" refers to the sensor model number.

- 3.9 At the PC, type "VG". The sensor will enter the V mode (Extended Diagnostics) and respond with:

VPXXXXXXXXPPPP PPPOPP PPP PPPP XXXX XX

The sensor status bytes reported above should be all "P" for pass with the exception of byte 22, which should be "0" or "1". A "1" indicates the "Heater Diagnostics" for the hood and electronics heaters are being used, a "0" indicates they are not. If any of the "P"s are reported as "F"s, refer to the ASOS Site Maintenance Manual troubleshooting procedures before proceeding. The values marked with "X" are irrelevant to this procedure and should be ignored.

4. HEATER POWER SUPPLY CHECK
 - 4.1 Disconnect the hood/electronics heater thermostat from backplane connector J7.
 - 4.2 Jumper the contacts on the J7 backplane connector together using the jumper assembly supplied with the visibility calibration kit. This will enable the hood/electronics heaters.
 - 4.3 Set the DMM for DC volts and connect the (-) lead to the heater power supply capacitor C2 negative terminal. Connect the (+) lead to the C2 positive terminal. See attached drawing of power supply, Figure 3.
 - 4.4 At the heater power supply regulator board, adjust R4 for 24.00 ± 0.25 VDC as read on the DMM. See attached drawing of power supply, Figure 3.
 - 4.5 Disconnect the DMM and remove jumper from J7.
5. HEATER CALIBRATION
 - 5.1 Unlatch two fasteners and carefully remove transmitter assembly cap from the back of transmitter assembly.

Table 1. (continued)

- 5.2 Using small flat-tipped screwdriver, slide locking mechanism (plate at front of connector) downward to unlock DB-9 connector. **DO NOT** disconnect the DB-9 connector at this time. See attached drawing of canister end view for connector location, Figure 4.
- 5.3 Repeat steps 5.1 and 5.2 for the receiver assembly.
- 5.4 At the PC, type "V3". The sensor will enter the "Heater Calibration" mode. Follow the instructions displayed on the PC screen. The "Heater Calibration" mode can be aborted at any time by striking the <ESC> key. See attached drawing of canister end view for connector location, Figure 4.
6. TEAR DOWN
- 6.1 At the PC, type "VG". Byte 20 of the sensor response will be "F". Type "VG" again. The sensor should respond as outlined in step 3.9.
- 6.2 At the DCP, turn the visibility sensor circuit breaker to OFF.
- 6.3 At the receiver assembly DB-9 connector, using a small flat-tipped screwdriver, press up on locking mechanism to lock DB-9 connector.
- 6.4 Repeat step 6.3 for the transmitter assembly.
- 6.5 Install transmitter assembly cap and latch two fasteners.
- 6.6 Install receiver assembly cap and latch two fasteners.
- 6.7 Disconnect the PC DB-9 cable connector from the fiber optic modem and install the DB-9 cable connector removed in step 3.5.
- 6.8 Close the electronics enclosure door and secure.
- 6.9 Raise visibility sensor and install hinge pin.
- 6.10 At the DCP, turn the visibility sensor circuit breaker to ON.

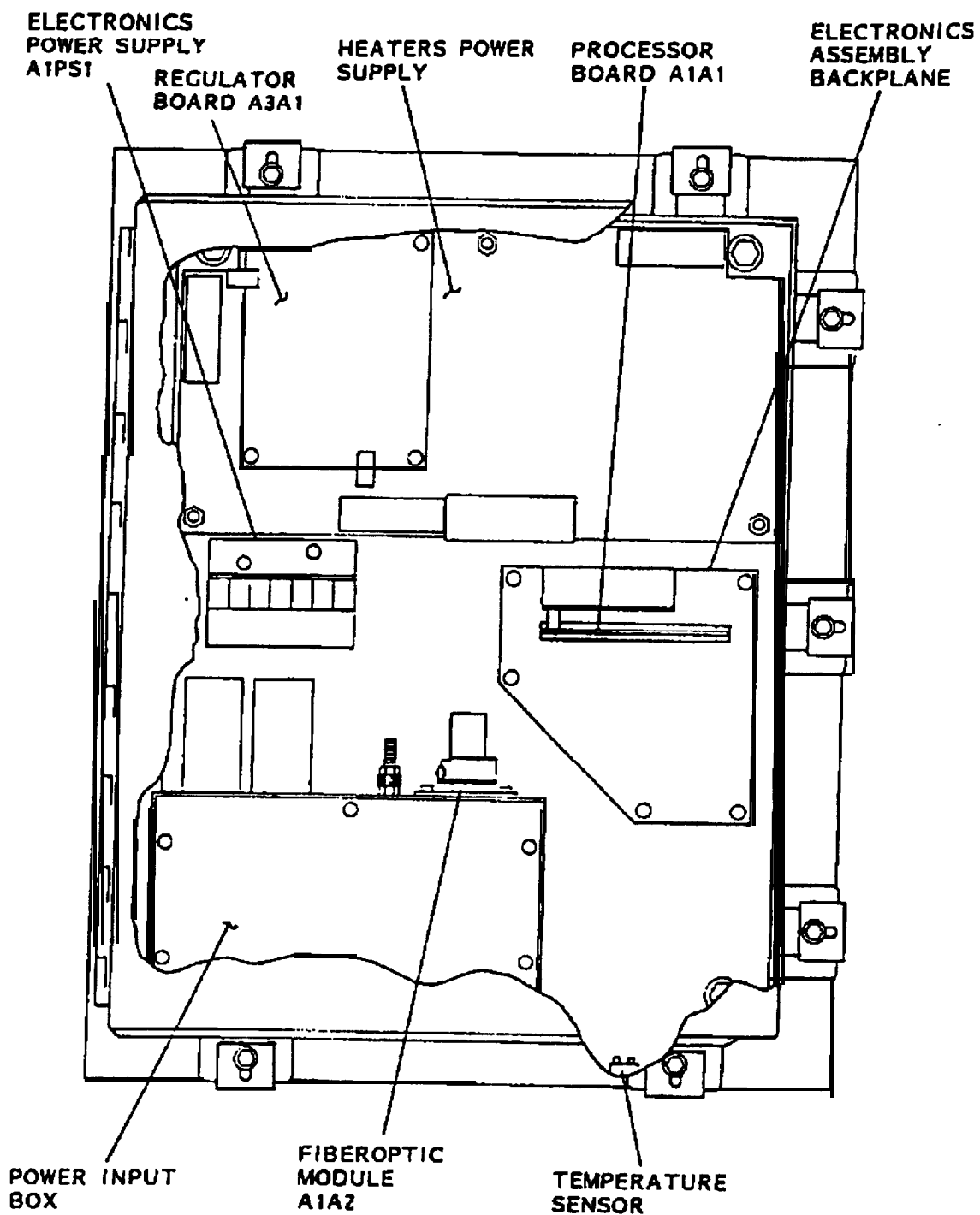
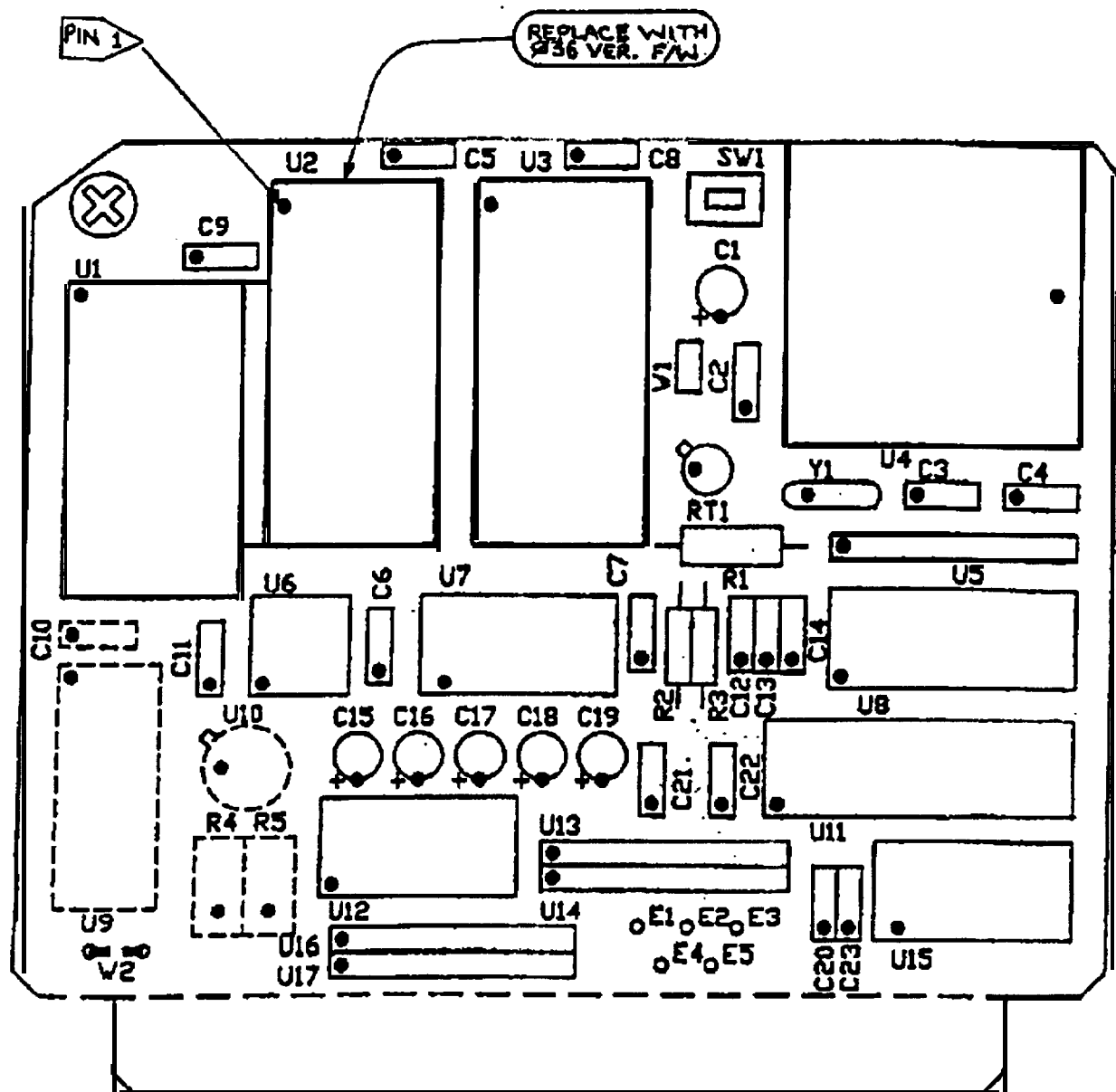
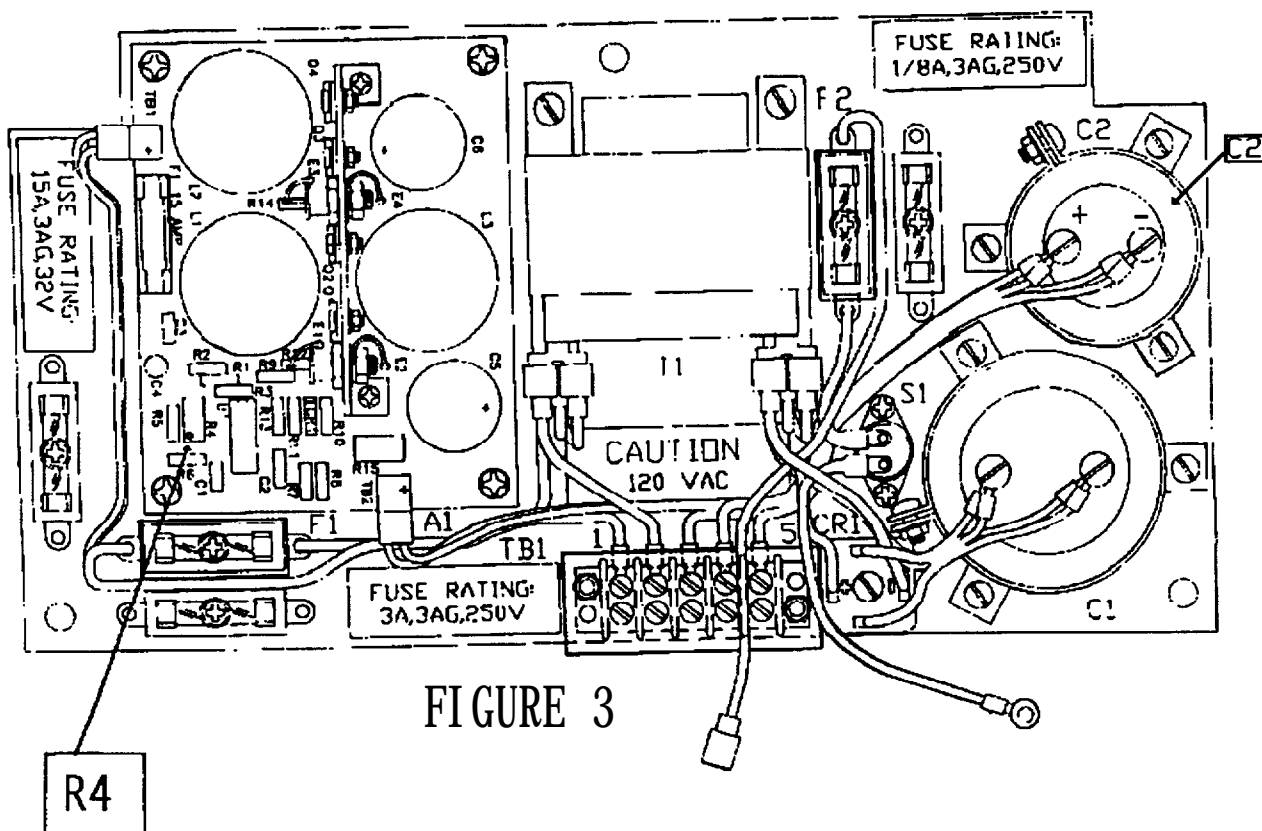
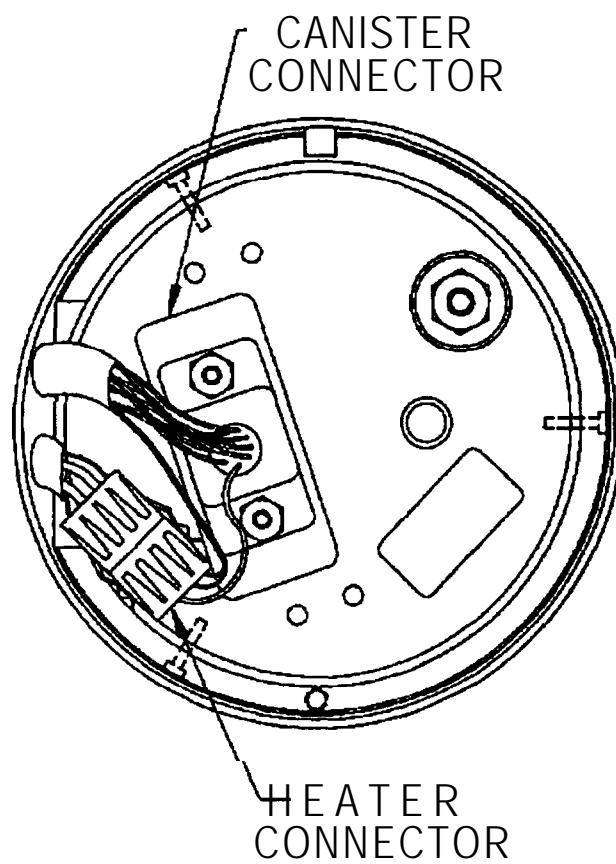


Figure 1 Visibility Sensor Electronics Enclosure



VISIBILITY PROCESSOR BOARD
P/N 32194-1
FIGURE 2





RECEIVER & TRANSMITTER CANISTER, END VIEW

FIGURE 4

INSTRUCTIONS

FIELD MODIFICATION KIT - Visibility Sensor Crossarm P/N 31830

1.0 Prevention of Cables Snagging

1.1 GENERAL

Description of Change:

A stainless steel shield will be inserted into each visibility sensor crossarm housing to restrain the cables from contacting the transmitter and receiver canisters. This will prevent the canisters from snagging the cables during insertion and removal. The intent is to prevent undue stress on the cables and thus improve service life.

1.2 PROCEDURE

Table 2 provides the procedure to remove and install the hood cable guides.
Material Required: 2 each Hood Cable Guides

Table 2. Replacing Visibility Hood Cable Guide

Step	Procedure
VISIBILITY SENSOR HOOD CABLE GUIDE INSTALLATION PROCEDURE	
Tools Required:	15 feet of rope 15/16-inch wrench No. 1 Phillips screwdriver Small flat-tipped screwdriver Seam ripping tool

WARNING

Death or severe injury may result if power is not removed from sensor before performing maintenance activities.

1. Coordinate with site observer, if applicable, and make an entry in the SYSLOG.
2. At the DCP cabinet, set the visibility sensor circuit breaker module to OFF (right) position.
3. Remove the receiver canister from the visibility crossarm in accordance with the Site Technical Manual Table 6.5.7.
4. Install the hood cable guide as follows:

- a. Shrinkable tubing on the heater wires coming from the window assembly and the signal cables coming through the crossarm must be eliminated from the hood cavity., A seam ripping tool is provided with the retrofit kit for use in stripping the tubing from the wire bundles. With steady pressure, the tool will slit the tubing as it is pressed inward.

Remove all of the tubing from the heater wire bundle.

Remove enough tubing from the signal wire bundle so none remains in the hood cavity; about 1 inch beyond the point where it enters the hood from the crossarm. There is sufficient slack in the bundle to allow it to be pulled far enough into the cavity.

- b. With the tubing removed, the wire bundles can be "flattened" against the side of the hood. Arrange the wires so the larger heater wires, the green ground wire, and the coax cable are at the bottom as shown in the attached drawing.
- c. The cable guides are symmetrical, so they will fit in either hood. Holding the wires against the side of the hood, insert the guide so it is positioned between the upper and innermost of the canister slides. You will feel a positive indication that it is

Table 2. (continued)

captured. Slowly press inward, keeping a slight pulling pressure on the wires to keep them from being snagged by the leading edge of the guide. Some "wiggling" might be required. The guide has been completely inserted when it "bottoms-out" against the window assembly.

- d. The angular shape of the ends of the guides allows the wiring to be reattached to the canister assemblies as usual.
5. Re-install the receiver canister into the crossarm in accordance with the Site Technical Manual Table 6.5.7.
6. Remove the transmitter canister from the visibility crossarm in accordance with the Site Technical Manual Table 6.5.7.
7. Install the hood cable guide as follows:
 - a. Using the seam ripping tool provided, strip the tubing from the wire bundles. With steady pressure, the tool will slit the tubing as it is pressed inward.

Remove all of the tubing from the heater wire bundle.

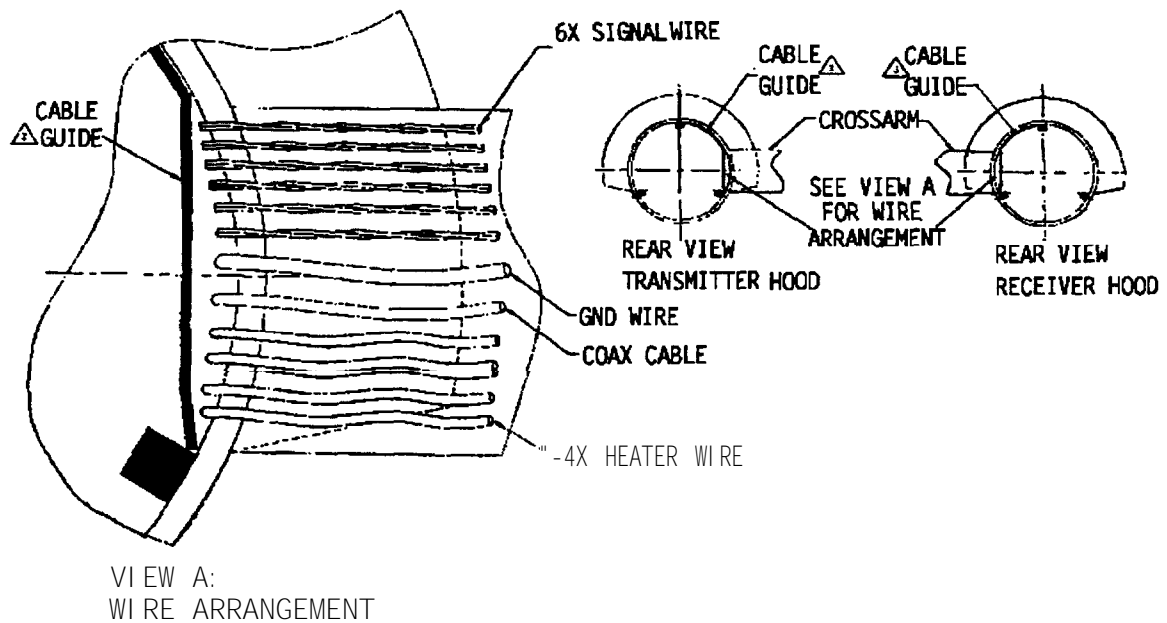
Remove enough tubing from the signal wire bundle so none remains in the hood cavity; about 1 inch beyond the point where it enters the hood from the crossarm. There is sufficient slack in the bundle to allow it to be pulled far enough into the cavity.
 - b. With the tubing removed, the wire bundles can be "flattened" against the side of the hood. Arrange the wires so the larger heater wires, the green ground wire, and the coax cable are at the bottom as shown in the attached drawing.
 - c. The cable guides are symmetrical, so they will fit in either hood. Holding the wires against the side of the hood, insert the guide so it is positioned between the upper and innermost of the canister slides. You will feel a positive indication that it is captured. Slowly press inward, keeping a slight pulling pressure on the wires to keep them from being snagged by the leading edge of the guide. Some "wiggling" might be required. The guide has been completely inserted when it "bottoms-out" against the window assembly.
 - d. The angular shape of the ends of the guides allows the wiring to be reattached to the canister assemblies as usual.
8. Re-install the transmitter canister into the crossarm in accordance with the Site Technical Manual Table 6.5.7.

Table 2. (continued)

9. At the DCP cabinet, set the visibility sensor circuit breaker module to ON (left) position.
10. Coordinate with site observer, if applicable, and clear any maintenance flags generated, making an entry in the SYSLOG.

NOTES:

1. INTERPRET DRAWING PER DOD -STD. 100
 2. WORKMANSHIP PER MIL-STD-45A, REQUIREMENT NO. 9
- ⚠ : INSERT CABLE GUIDE AFTER THE WIRES HAVE BEEN ARRANGED IN REAR HOOD (AS SHOWN)



ERRATA SHEET 1 (for Electronic Technicians)

Engineering Division

W/OS0321: BGM

Additional Information to Modification Note 13 dated June 9, 1994

General

Errata sheet number 1 provides instructions to correct EHB-11, section 3.6, pages 1, A-4, and A-5 of modification note 13. The reason for the change is to provide additional information after modification note 13 was published.

Effects on Other Instructions

Pages 1, A-4 and A-5 of modification note 13, Volume 2, EHB-11, Section 3.6.

Procedure:

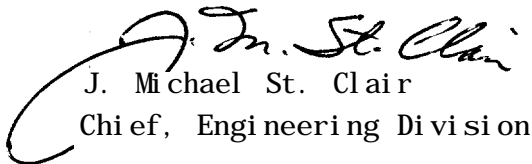
1. Add the following information to Special Tools Required on page 1.

ADD: Pen-and-ink change.

TE305-1 may not be included in the visibility calibration kit TE305.

The jumper TE305-1 can be ordered directly from NLSC.

2. Remove and replace pages A-3, A-4 and A-5 with the updated pages provided with this errata sheet.



J. Michael St. Clair
Chief, Engineering Division

Table 1. (continued)

12. Coordinate with site observer, if applicable, and clear any maintenance flags generated, making an entry in the SYSLOG.
13. Return signed front page of FMK, along with version 034 EPROM, to NRC.

VISIBILITY SENSOR HEATER CALIBRATION PROCEDURE

1 INTRODUCTION

Use this procedure when installing firmware containing changes to solve the heater diagnostic problem. The new firmware contains a command "V3" which instructs the operator to "calibrate the heater current readings." The "V3", command tells the operator exactly how to enable the firmware to measure the actual current drawn by each of the heaters. There are no special fixtures needed to perform "V3", and it does not matter if the sensor is in "ASOS mode" or not.

Calibration procedures 4 and 5 must be run any time the visibility crossarm, transmit canister, receiver canister, or day/night sensor are replaced.

2. TOOLS AND EQUIPMENT

PC with Procomm Plus or equivalent software
RS232 adapter cables
Digital Multimeter (DMM)
Jumper for the contacts of J7 connector on backplane
Small flat-tipped screwdriver

3. SETUP PROCEDURE

- 3.1 At the DCP, locate the circuit breaker for the visibility sensor and switch to the OFF position.
- 3.2 At the visibility sensor, remove hinge pin and lower sensor.
- 3.3 Open the electronics enclosure. Locate U2 on the processor board and remove the microcircuit using standard ESD precautions. See figure 2.
- 3.4 Install the new microcircuit supplied into U2 socket, assuring that pin 1 of the microcircuit matches pin 1 of the socket.
- 3.5 Disconnect the DB-9 cable connector from the fiber optic modem on top of the Faraday box.
- 3.6 Connect the PC to the DB-9 cable connector in the electronics enclosure. Set the PC to "2400, N, 8, 1" with CAPS LOCK to establish the correct communications protocol with the sensor.
- 3.7 At the DCP, turn the visibility sensor circuit breaker to ON.

Table 1 (continued)

- 3.8 Verify that the PC displays the sensor initialization message shown.

*** VIS VER XXX - 6220 ***

The "XXX" refers to the sensor firmware version number and the "6220" refers to the sensor model number.

- 3.9 At the PC, type "VG". The sensor will enter the V mode (Extended Diagnostics) and respond with:

VPXXXXXXXXPPPP PPPOPP PPP PPPP XXXX XX

The sensor status bytes reported above should be all "P" for pass with the exception of byte 22, which should be "0" or "1". A "1" indicates the "Heater Diagnostics" for the hood and electronics heaters are being used, a "0" indicates they are not. If any of the "PI's are reported as "F"s, refer to the ASOS Site Maintenance Manual troubleshooting procedures before proceeding. The values marked with "X" are irrelevant to this procedure and should be ignored.

4. HEATER POWER SUPPLY CHECK

- 4.1 Disconnect the hood/electronics heater thermostat from backplane connector J7.
- 4.2 Jumper the contacts on the J7. backplane connector together using the jumper assembly (TE305-1) of supplied with the visibility calibration it. This will enable the hood/electronics heaters.
- 4.3 Unlatch two fasteners and carefully remove transmitter assembly cap from the back of transmitter assembly.
- 4.4 Using small flat-tipped screwdriver, slide locking mechanism (plate at front of connector) downward to unlock DB-9 connector. DO NOT disconnect the DB-9 connector at this time. See attached drawing of canister end view for connector location, Figure 4.
- 4.5 Repeat steps 4.3 and 4.4 for the receiver assembly.
- 4.6 Set the DMM for DC volts and connect the (-) lead to the heater power supply capacitor C2 negative terminal. Connect the (+) lead to the C2 positive terminal. See attached drawing of power supply, Figure 3.
- 4.7 Wait 5 minutes for heater current to stabilize. At the heater power supply regulator board, adjust R4 for $24.00 \pm 0.25 - 0.00$ VDC as read on the DMM. See attached drawing of power supply, Figure 3.

5. HEATER CALIBRATION

- 5.1 Disconnect the DMM and remove jumper from J7.
- 5.2 At the PC, type "V3". The sensor will enter the "Heater Calibration" mode. Follow the instructions displayed on the PC screen. The "Heater Calibration" mode can be aborted at any time by striking the <ESC> key. See attached drawing of canister end view for connector location, Figure 4.

Table 1 (continued)

6. TEAR DOWN

- 6.1 At the PC, type "VG". Byte 20 of the sensor response will be "F". Type "VG" again. The sensor should respond as outlined in step 3.9.
- 6.1A At the PC type VF. Enter password EIEIO. Press enter until serial number requested. Enter sensor serial number. Press enter until the VF command is completed. Press CNTRL> A
- 6.2 At the DCP, turn the visibility sensor circuit breaker to OFF.
- 6.3 At the receiver assembly DB-9 connector, using a small flat-tipped screwdriver, press up on locking mechanism to lock DB-9 connector.
- 6.4 Repeat step 6.3 for the transmitter assembly.
- 6.5 Install transmitter assembly cap and latch two fasteners.
- 6.6 Install receiver assembly cap and latch two fasteners.
- 6.7 Disconnect the PC DB-9 cable connector from the fiber optic modem and install the DB-9 cable connector removed in step 3.5.
- 6.8 Close the electronics enclosure door and secure.
- 6.9 Raise visibility sensor and install hinge pin.
- 6.10 At the DCP, turn the visibility sensor circuit breaker to ON.

ASOS MODIFICATION NOTE 14 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM

SUBJECT : Software Version 2.0 for Voice Processor Board 1A2A20

PURPOSE : To add operational enhancements for the ASOS.

EQUIPMENT AFFECTED: ASOS

PARTS REQUIRED :

- Microcircuit P/N 62828-45010-1
- Microcircuit P/N 62828-45011-1
- Microcircuit P/N 62828-45012-1
- Microcircuit P/N 62828-45013-1
- Microcircuit P/N 62828-45014-1
- Microcircuit P/N 62828-45015-1
- Microcircuit P/N 62828-45016-1
- Microcircuit P/N 62828-45017-1

MOD PROCUREMENT : The above parts will be provided through NLSC as ASOS Field Modification Kit (FMK) #60. ECPs E93SM05F075 and E93SM05F077

SPECIAL TOOLS REQUIRED :

- IC insertion tool
- Small flat-tipped screwdriver
- Conductive foam
- Electrostatic discharge (ESD) straps

TIME REQUIRED : 1.5 hour

EFFECT ON OTHER INSTRUCTIONS : None.

CERTIFICATION STATEMENT : This modification was tested for operational integrity in the Engineering Design Branch Laboratory and sites listed in Appendix B of ASOS Modification Note 10.

GENERAL

This modification note provides instructions to upgrade the ASOS voice firmware by removing and replacing erasable programmable read only memory (EPROM) microcircuits. The note provides procedures for the removal and installation of the EPROM firmware. Modification Notes 10: ACU Software Version 2.1 and 15: Port Sharing Device are to be installed in conjunction with this modification if required.

See ASOS Modification Notes 10 and 15 in EHB-11, Section 3.6. Voice processor version 2.0 will operate correctly with ACU software version 2.1 and later. Do not install the voice processor software version 2.0 with ACU software versions lower than 2.1

PROCEDURE

Attached are the instructions for field modification kit FMK 60. FMK 60 describes the installation of EPROMs U11, U12, U13, U14, U31, U32, U33, and U34 on the voice processor board 1A2A20.

BEFORE INSTALLING FIRMWARE

1. Call the AOMC at 1-800-242-8194. Inform the person who answers the phone at which office you will be installing new firmware.
2. For commissioned sites, get approval of the responsible MIC/OIC before starting installation. For non-commissioned sites, the el tech must coordinate with the site MIC/OIC before starting installation. You may install on any day of the month if permission is granted and the restrictions in steps 3 and 4 are complied with.
3. **Commissioned Sites Only:** Do not start installation during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of those conditions is expected within 3 hours. These meteorological conditions will be defined by the responsible MIC/OIC.
4. Do not start firmware installation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z.
5. Immediately before beginning work at NWS staffed sites, the MIC/OIC/Observer will inform the tower and any other critical users that ASOS will be shut off for firmware upgrade (unstaffed sites, the el tech will inform tower).
6. Do not begin the installation process until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.
7. The system voice function will automatically broadcast "not available" message when the ACU power is turned off.
8. Make the appropriate SYSLOG entries (MAINT-ACT-FMK) #060. Install the firmware by following the instructions in Appendix A - Instructions for FMK - ACU voice processor board firmware version upgrade.

AFTER INSTALLING FIRMWARE

9. When ASOS is restarted at unstaffed sites, call to inform towers using CVDs and OIDs that the work is complete. (At staffed sites, the MIC/OIC observer will call the tower).
10. If on-site NWS staff provides backup while the installation is underway, no special observation is needed when ASOS is restarted. Proceed to step 11.

If there is no backup on site and a record observation was missed during the installation, a special observation must be taken when ASOS is restarted. The el tech should take the following steps at the ASOS keyboard after installation:

- a. Press [SIGN].
- b. Type his/her initials and press [RETURN].
- c. Type the observer level password and press [RETURN].
- d. Press [GENOB].
- e. Press [SPECL].
- f. Press [EXIT].
- g. Press [SIGN].
- h. Type his/her initials again and press [RETURN].
- i. Press [RETURN] twice. This signs the "observer" off ASOS.
- j. Leave ASOS running.

Note: The "observer" must sign off before the 5-minute edit time is up.

11. Inform office staff that ASOS is again operational. The chart below indicates how long it takes after start up for ASOS to report each observation element automatically.

Times Needed for Elements to be Reported Automatically

	<u>Minimum</u>	<u>Maximum</u>
Pressure	60 seconds	10 minutes
Precipitation Amount	60 seconds	*
Wind direction	2 minutes	7 minutes
Wind speed	2 minutes	7 minutes
Precipitation Type	2 minutes	*
Temperature	5 minutes	10 minutes
Dew Point	5 minutes	10 minutes
Visibility	10 minutes	15 minutes
Obstruction to Visibility	10 minutes	*
Ceiling	30 minutes	35 minutes

* Maximum time not applicable since phenomena may not be present.
Minimum time applies if phenomena are present.

12. Verify that ASOS transmitted an hourly observation. Call the AOMC at 1-800-242-8194 and tell the operator:

- a. Your location,
- b. That installation of the new firmware has been completed, and
- c. That ASOS is operational.

13. Enter in the SYSLOG that maintenance has been completed.

14. At an expansion site with ATCT, the el tech will contact ATCT and supply information on the following:

- a. ASOS maintenance completed,
- b. ASOS restored to service, and

- C. Tower CVDs and OIDs need to be turned on, and TRACON asked to turn on their displays.

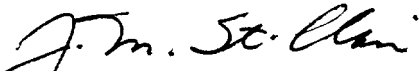
REPORTING MODIFICATION

Target date for completing this modification is 30 days after receipt of parts. Report completed modification on WS Form H-28, Engineering Progress Report, for each system per instructions in EHB-4, part 2, using reporting code ASOS.

Make appropriate entries in the SYSLOG using the Maintenance Action keys, Field Modification keys, and comment fields. Follow these steps:

1. Log on as TECH.
2. Key the MAINT screen.
3. Key the ACTION page
4. Key START - Stop here and perform the modification FMK-60. After FMK-60 is complete, log on system.
5. Key the MAINT screen.
6. Key the ACTION page.
7. Key FMK - Enter the Field Mod Kit (FMK) number as follows: FMK60
On the second line of the screen verify that only FMK60 is displayed. Complete by entering Y in the Y/N if only FMK60 is displayed.
8. Check the SYSLOG and verify the FMK message. Notify the AOMC via telephone that FMK 60 is complete.

NOTE: Unused parts and the old EPROMs are to be returned to NRC as S100-FMK0600LD.



Chief, Engineering Division
J. Michael St. Clair

Attachment

**INSTRUCTIONS
FIELD MODIFICATION KIT - ACU VOICE PROCESSOR BOARD
FIRMWARE VERSION UPGRADE**

1. UPGRADING ACU VOICE PROCESSOR BOARD FIRMWARE

1.1 GENERAL

Digital voice processing consists of three operations: producing a verbal report based on current ASOS data from a stored vocabulary, recording an operator-generated addendum up to 90 seconds long, and producing an output consisting of the automatically generated data and the operator input. Outputs are available for the FAA handset, dial-up reports, and FAA radio communications for aircraft. Voice processing is accomplished with two dedicated boards: a Voice Processor board and a Voice Recorder/Playback board. The Voice Processor board contains the CPU for the digital voice system. It receives digital voice files from the ASOS CPU, creates voice reports consistent with the data reported by the sensors, and receives operator-generated digitized audio from the Voice Recorder/Playback board. The Voice Recorder/Playback board receives digitized voice from the Voice Processor board and converts the data into audio. Audio is output for dial-in weather requests, for the FAA handset at OID port 5C, and to an FAA transmitter for pilot use. In addition, the Voice Recorder/Playback board receives input voice audio from the FAA handset, digitizes the input audio, and transfers the digitized audio to the Voice Processor board for storage in random access memory (RAM).

1.2 FIRMWARE UPGRADE PROCEDURE

The procedure to upgrade the ACU voice firmware by removing and replacing the eight EPROMs on the Voice Processor board is followed. See Figure 1.

Step	Procedure
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REMOVAL

Tools/material required:

- Small flat-tipped screwdriver
- IC insertion tool
- Conductive foam

CAUTION

Damage to equipment may result if power is not removed prior to removal or installation. Ensure that **OUTPUT POWER** switch is set to 0 (off) position and that facility power is removed.

To avoid damage to circuit boards, use proper electrostatic discharge (ESD) handling procedures, including the use of a grounding strap, when performing the following steps.

1. Set OUTPUT POWER switch on UPS status panel to 0 (off) position. Output indicator on status panel extinguishes.
2. Remove facility power from ACU cabinet.
3. Using ASOS Site Maintenance Manual, locate circuit board to be removed.
4. When removing Voice Processor Board 1A2A20, disconnect cable from front of board by exerting outward force on cable release tabs at top and bottom of connector.
5. Using small flat-tipped screwdriver, loosen captive screws at top and bottom of board.
6. If board is equipped with extractor handles, press handles in opposite directions to release board. If board does not have extractor handles, gently rock board while exerting outward pressure and remove board from rack.

CAUTION

Throughout this procedure, discharge screwdriver before and during use by touching tool to grounded chassis surface. Failure to comply may result in damage to integrated circuits.

Step	Procedure
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CAUTION

Lift integrated circuit as evenly as possible. Failure to comply may result in damage to integrated circuits.

7. From front of board, slide small flat-tipped screwdriver between integrated circuit U11 and its IC socket. Carefully pry up on U11 to lift it from socket as evenly as possible. Remove U11 from socket and place in conductive foam or on another static-free surface.
8. Repeat step 7 for integrated circuits U12, U13, U14, U31, U32, U33, and U34.

INSTALLATION

Tools/material required:

Small flat-tipped screwdriver
IC insertion tool

CAUTION

Damage to equipment may result if power is not removed prior to removal or installation. Ensure that OUTPUT POWER switch is set to 0 (off) position and facility power is removed.

To avoid damage to circuit boards, use proper ESD handling procedures, including the use of a ground strap, when performing the following steps.

1. Verify that OUTPUT POWER switch on UPS status panel is set to 0 (off) position and OUTPUT indicator on status panel is extinguished.
2. Verify that facility power is removed from ACU cabinet.

CAUTION

Throughout this procedure, discharge IC insertion tool before and during use by touching tool to grounded chassis surface. Failure to comply may result in damage to integrated circuits.

Step	Procedure
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3. Using IC insertion tool, remove new EPROM integrated circuits from protective packaging and insert into Voice Processor board IC sockets in accordance with the following chart. Ensure that EPROMs are installed with pin 1 (as identified by notch in top of IC) oriented toward top of Voice Processor board as shown on Figure 1.

IC socket	IC Part number
U11	62828-45010-1
U12	62828-45011-1
U13	62828-45012-1
U14	62828-45013-1
U31	62828-45014-1
U32	62828-45015-1
U33	62828-45016-1
U34	62828-45017-1

4. Holding board by handles, position board with component side to right and carefully slide board into card rack on its guides. Align board with rear connector and press into place.

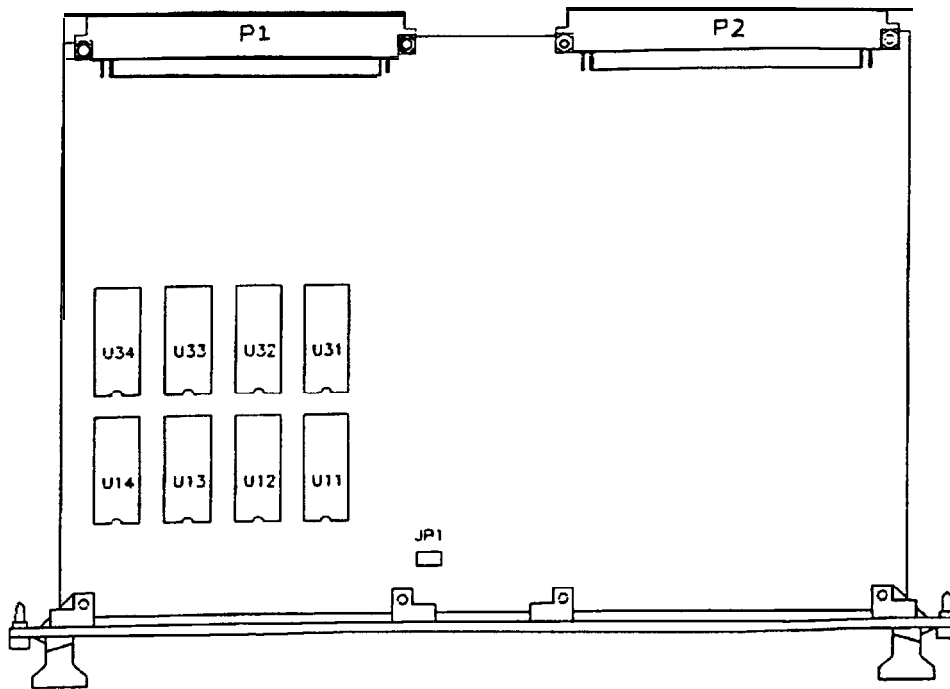
Using small flat-tipped screwdriver, tighten captive screws at top and bottom of board.

When installing Voice Processor board 1A2A20, connect cable attached to the front of board as follows:

- a. Position connector extraction tabs to their fully extended position.
 - b. Locate cable keys and position keys to right; install cable in connector.
7. This completes Modification Note 14. Modification Notes 10 and 15 must be completed in conjunction with this note before going to step 8.
 8. Apply facility power to ACU cabinet.
 9. Set OUTPUT POWER switch to 1 (on) position.

This completes the installation.

FIGURE 1



VOICE PROCESSOR BOARD 1A2A20

ASSY 62828-47018-10

ALL COMPONENTS NOT SHOWN

IC socket

IC part number

U11	62828-45010-1
U12	62828-45011-1
U13	62828-45012-1
U14	62828-45013-1
U31	62828-45014-1
U32	62828-45015-1
U33	62828-45016-1
U34	62828-45017-1

ASOS MODIFICATION NOTE 15 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM

SUBJECT : Installation of Port Sharing Device Memory Board

PURPOSE : To add maintenance capability and operational enhancements for the ASOS.

EQUIPMENT AFFECTED: ASOS

PARTS REQUIRED : Parts listed in installation instructions

MOD PROCUREMENT : The above parts will be provided by NLSC as an ASOS Field Modification Kit (FMK) S100-FMK057.
ECP E93SM05F042

SPECIAL TOOLS : None
REQUIRED

TIME REQUIRED : 1 hour

EFFECT ON OTHER : Must be completed concurrent with ASOS Modification
INSTRUCTIONS Notes 10 and 14.

Attached to this modification note is a revised modification index for EHB-11, Volume 2, Section 3.6. Also attached is a list of Field Modification Kits generated for ASOS. Detach these indexes and insert them in EHB-11, Volume 2, Section 3.6.

CERTIFICATION : This modification is being tested for operational
STATEMENT integrity in the Engineering Design Branch laboratory and at St. Cloud, MN (STC).

GENERAL

This modification note provides installation and checkout procedures to add an additional memory board for port sharing device (PSD) operation. The PSD is a software task executing within the acquisition control unit (ACU) that enables the single port on the Remote Terminal to AFOS (RTA) to communicate with both ASOS and the Auxiliary Backup Terminal (ABT).

Installation of this modification can only be completed on systems with ACU software version 2.1 or later. Refer to ASOS Modification Note 10.

PROCEDURE

Attached are the installation and checkout procedures in FMK#057.

BEFORE INSTALLING FIRMWARE

1. Call the AOMC at 1-800-242-8194. Inform the person who answers the phone at which office you will be installing new firmware.
2. For commissioned sites, get approval of the responsible MIC/OIC before starting installation. For non-commissioned sites, the el tech must coordinate with the site MIC/OIC before starting installation. You may install on any day of the month if permission is granted and the restrictions in steps 3 and 4 are complied with.
3. **Commissioned Sites Only:** Do not start installation during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of those conditions is expected within 3 hours. These meteorological conditions will be defined by the responsible MIC/OIC.
4. Do not start firmware installation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z.
5. Immediately before beginning work at NWS staffed sites, the MIC/OIC/Observer will inform the tower and any other critical users that ASOS will be shut off for firmware upgrade (unstaffed sites, the el tech will inform tower).
6. Do not begin the installation process, until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.
7. The system voice function will automatically broadcast "not available" message when the ACU power is turned off.
8. Make the appropriate SYSLOG entries (MAINT-ACT-FMK) #057.

AFTER INSTALLING FIRMWARE

9. When ASOS is restarted at unstaffed sites, call to inform towers using CVDs and OIDs that the work is complete. (At staffed sites, the MIC/OIC observer will call the tower).
10. If on-site NWS staff provides backup while the installation is underway, no special observation is needed when ASOS is restarted. Proceed to step 11.

If there is no backup on site and a record observation was missed during the installation, a special observation must be taken when ASOS is restarted. The el tech should take the following steps at the ASOS keyboard after installation:

- a. Press [SIGN].
- b. Type his/her initials and press [RETURN].
- c. Type the observer level password and press [RETURN].
- d. Press [GENOB].
- e. Press [SPECL].
- f. Press [EXIT].
- g. Press [SIGN].
- h. Type his/her initials again and press [RETURN].
- i. Press [RETURN] twice. This signs the "observer" off ASOS.
- j. Leave ASOS running.

Note: The "observer" must sign off before the 5-minute edit time is up.

11. Inform office staff that ASOS is again operational. The chart below indicates how long it takes after start up for ASOS to report each observation element automatically.

Times Needed for Elements to be Reported Automatically

	<u>Minimum</u>	<u>Maximum</u>
Pressure	60 seconds	10 minutes
Precipitation Amount	60 seconds	*
Wind direction	2 minutes	7 minutes
Wind speed	2 minutes	7 minutes
Precipitation Type	2 minutes	*
Temperature	5 minutes	10 minutes
Dew Point	5 minutes	10 minutes
Visibility	10 minutes	15 minutes
Obstruction to Visibility	10 minutes	*
Ceiling	30 minutes	35 minutes

* Maximum time not applicable since phenomena may not be present.
Minimum time applies if phenomena are present.

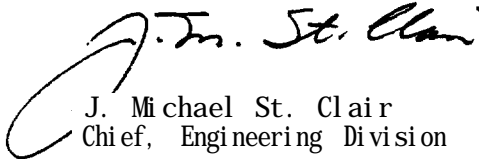
12. Verify that ASOS transmitted an hourly observation. Call the AOMC at 1-800-242-8194 and tell the operator:
 - a. Your location,
 - b. That installation of the new firmware has been completed, and
 - c. That ASOS is operational.
13. Enter in the SYSLOG that maintenance has been completed.
14. At an expansion site with ATCT, the el tech will contact ATCT and supply information on the following:
 - a. ASOS maintenance completed,
 - b. ASOS restored to service, and
 - c. Tower CVDs and OIDs need to be turned on, and TRACON asked to turn on their displays.

REPORTING MODIFICATION

Target date for completing this modification is 30 days after receipt of parts. Report completed modification on WS Form H-28, Engineering Progress Report, for each system per instructions in EHB-4, part 2, using reporting code ASOS.

Make appropriate entries in the SYSLOG using the Maintenance Action keys, Field Modification keys, and comment fields. Follow these steps:

1. Log on as TECH.
2. Key the MAINT screen.
3. Key the ACTION page.
4. Key START - Stop here and perform the modification FMK-057. After FMK-057 is complete, log on system.
5. Key the MAINT screen.
6. Key the ACTION page.
7. Key FMK - Enter the Field Mod Kit (FMK) number as follows: FMK057. On the second line of the screen verify that only FMK057 is displayed. Complete by entering Y in the Y/N if only FMK057 is displayed.
8. Check the SYSLOG and verify the FMK message. Notify the AOMC via telephone that FMK 057 is complete.



J. Michael St. Clair
Chief, Engineering Division

Attachments

Instructions Field Modification Kit PORT SHARING DEVICE

PARTS LIST

<u>PART NUMBER</u>	<u>QTY</u>	<u>NOMENCLATURE</u>
62828-47028-20	1 ea	Memory board
62828-90197-6	1 ea	ABT adaptor
62828-90197-7	1 ea	RTA adaptor
62828-47014	1 ea	SI0 board
62828-90148-1	1 or 2 ea	RS232 surge adaptor
62828-90206-2	6 ea	RJ45 connector
62828-90205-2	50 ft	8-wire Telco cable
M24308/26-1	4 or 8 ea	Screw lock assembly
62828-40236-1	1 ea	NWS RTA label
62828-40237-1	1 ea	NWS ABT label
62828-40096-1	1 ea	ACU stuffing chart

NOTE: Two RS232 SI0 ports are needed to install the port sharing device.
Install SI0 board only if system does not have two unused RS232 ports.

PROCEDURE

1. On OID press REVUE SITE - CONFIG - COMMS. Are there two unused RS232 ports available?

NOTE: SI0 #1 cannot be used for Port Sharing Device.

2. If there are, record the spare port locations (e.g., SI05-3 & SI05-4). If there are not two spare SI0 ports available, an additional board will need to be installed; record how many SI0 boards are currently installed in system.

SPARE SI0 PORT 1.	2.	No. SI0 BOARDS
-------------------	----	----------------

3. ACU CLASS II SYSTEMS ONLY. Set output power switch on UPS status panel 1A4 to 0 (OFF).
4. Remove facility power from ACU.
5. Remove the blank panel from VME slot 1A2A4.
6. Remove IACK jumper from rear of VME backplane slot 1A2A4.
7. Install memory board P/N 62828-47028-20 in VME slot 1A2A4. Install jumper J34B on memory board before installing. See Site Technical Manual page 2-207.
8. Remove old stuffing chart from ACU front door and install new stuffing chart provided in FMK.

ACU-SIO (RS-232) BOARD JUMPER CONFIGURATIONS

SIO #2 (1A2A6)		SIO #3 (1A2A7)		SIO #4 (1A2A8)	
62828-47014-10		62828-47014-20		62828-47014-30	
REF DES	DISPOSITION	REF DES	DISPOSITION	REF DES	DISPOSITION
JA1	IN	JA1	IN	JA1	IN
JA2	OUT	JA2	OUT	JA2	OUT
JA3	IN	JA3	IN	JA3	IN <i>ok</i>
JA10	OUT	JA10	OUT <i>in</i>	JA10	OUT <i>ok</i>
JA11	IN	JA11	IN <i>out</i>	JA11	IN <i>out</i>
JA12	IN	JA12	IN	JA12	IN
JA13	IN	JA13	IN	JA13	IN
JA14	IN	JA14	IN	JA14	IN
JA15	IN	JA15	IN	JA15	IN
J1	OUT	J1	OUT	J1	OUT

SIO #5 (1A2A9)		SIO #6 (1A2A10)		SIO #7 (1A2A11)	
62828-47014-40		62828-47014-50		62828-47014-60	
REF DES	DISPOSITION	REF DES	DISPOSITION	REF DES	DISPOSITION
JA1	IN	JA1	IN	JA1	IN
JA2	OUT	JA2	OUT	JA2	OUT
JA3	IN	JA3	IN	JA3	IN
JA10	OUT <i>in</i>	JA10	OUT	JA10	OUT <i>in</i>
JA11	IN	JA11	IN	JA11	IN <i>out</i>
JA12	IN <i>out</i>	JA12	IN <i>out</i>	JA12	IN <i>out</i>
JA13	IN	JA13	IN	JA13	IN
JA14	IN	JA14	IN	JA14	IN
JA15	IN	JA15	IN	JA15	IN
J1	OUT	J1	OUT	J1	OUT

NOTE: Perform steps 9-12 only if a SI0 board needs to be added to system; otherwise, skip to step 13.

9. In VME rack 1A2 remove the blank panel from first available SI0 slot (1A2A9, 1A2A10, or 1A2A11).
10. Configure SI0 board P/N 62828-47014 per chart in figure 1. For example, if SI0 board is SI0 X6 (1A2A10), set jumpers for a 62828-47014-50 board and mark board with appropriate dash number.
11. Install SI0 board in slot from which the blank panel was removed.
12. Remove IACK jumper from rear of VME backplane slot where SI0 board was installed in previous step.
13. Locate spare SI0 cable bundle inside ACU. Find cables for SI0 ports recorded in step 2 or the first two ports of the new SI0 board just installed.
14. Route these cables along the existing harness that runs to the I/O panel 1A9.
15. On I/O panel locate connectors 1A9J24 (AFOS HARDWIRE SPARE) and 1A9J27 (FAA TCCC). If these positions have connectors in them, disconnect cables that are attached to them on the inside of ACU. DO NOT remove surge protectors.
16. If connectors are not already installed, remove the blank panel from the connector slots 1A9J24 and 1A9J27.
17. Install surge protector P/N 62828-90148-1 in slots 1A9J24 and 1A9J27 using screw lock assemblies P/N M24308/26-1 on both ends of surge protectors.

NOTE: Place end of surge protector that has label closest to it next to I/O panel.

18. Install label NWS RTA covering AFOS HARDWIRE SPARE above 1A9J24.
19. Install label NWS ABT covering FAA TCCC above 1A9J27.
20. Connect one cable routed along harness to I/O panel in step 14 to 1A9J24 NWS RTA. Record the SI0 port number. This will be needed for system setup.

RTA PORT SI0

21. Connect one cable routed along harness to I/O panel in step 14 to 1A9J27 NWS ABT. Record the SI0 port number. This will be needed for system setup.

ABT PORT SIO

22. Connect an eight-wire Telco cable between 1A9J24 NWS RTA and J13 of RTA computer using adaptor P/N 62828-90197-7, Telco cable P/N 62828-90205-2, and two each RJ45 connectors P/N 62828-90206-2. RJ45 connectors are crimped "straight through":

P1-1	<----->	P2-1
P1-2	<----->	P2-2
P1-3	<----->	P2-3
P1-4	<----->	P2-4
P1-5	<----->	P2-5
P1-6	<----->	P2-6
P1-7	<----->	P2-7
P1-8	<----->	P2-8

23. Connect an eight-wire Telco cable between 1A9J27 NWS ABT and SWITCH BOX J58 using adaptor P/N 62828-90197-6, Telco cable P/N 62828-90205-2, and two each RJ45 connectors P/N 62828-90206-2. RJ45 connectors are crimped "straight through":

P1-1	<----->	P2-1
P1-2	<----->	P2-2
P1-3	<----->	P2-3
P1-4	<----->	P2-4
P1-5	<----->	P2-5
P1-6	<----->	P2-6
P1-7	<----->	P2-7
P1-8	<----->	P2-8

24. Connect an eight-wire Telco cable between SWITCH BOX J9 and COM1 of ABT computer using Telco cable P/N 62828-90205-2 and two each RJ45 connectors P/N 62828-90206-2. RJ45 connectors are crimped "straight through":

P1-1	<----->	P2-1
P1-2	<----->	P2-2
P1-3	<----->	P2-3
P1-4	<----->	P2-4
P1-5	<----->	P2-5
P1-6	<----->	P2-6
P1-7	<----->	P2-7
P1-8	<----->	P2-8

25. Apply facility power to ACU.
26. ACU CLASS II SYSTEMS ONLY. Set output power switch on UPS 1A4 to 1 (ON).
27. Sign on OID as a TECHNICIAN.

NOTE: Perform step 28 only if SIO board was added in step 11; otherwise, skip to step 29.

28. On OID press REVUE - SITE - CONFG - HDWE - CHANG and move cursor to ACU SIO. Press SEQN one time (increase SIO quantity by one). Press BACK - BACK - COMMS and go to step 30.

29. On OID press REVUE - SITE - CONFG - COMMS and move cursor to SIO slot recorded in step 20.

30. Press CHANG and set up port as follows:

FUNCTION	RTA	BITS/CHAR	8
STATUS	ENABLED	STOP BITS	
BAUD RATE	1200	HANDSHAKE	NONE
PARITY SELECT	NONE	CONNECTION	HARDWIRE

31. Press BACK and move cursor to SIO slot recorded in step 21.

32. Press CHANG and set up port as follows:

FUNCTION	ABT	BITS/CHAR	8
STATUS	ENABLED	STOP BITS	
BAUD RATE	1200	HANDSHAKE	NONE
PARITY SELECT	NONE	CONNECTION	HARDWIRE

33. Press EXIT.

34. A PSD diagnostic feature is available if there is a printer or a VDU locally configured in the system. A spare SIO port may be used if there is a terminal or printer and cables available. To access PSD DIAG feature, sign on OID as a technician and press REVUE - SITE - CONFG - COMMS.

35. Move cursor to Printer, VDU, or the spare SIO port to be used.

36. Press CHANG and set up port as follows:

FUNCTION	PSD DIAG	BITS/CHAR	8
STATUS	ENABLED	STOP BITS	1
BAUD RATE	9600	HANDSHAKE	NONE
PARITY SELECT	NONE	CONNECTION	HARDWIRE

37. Press EXIT. PSD diagnostic device is now ready to display or print messages pertaining to the operation of the PSD.

38. After PSD checkout is complete the SIO port used for PSD DIAG should be reconfigured to its original assignment.

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ASOS FMK/Modification Summary

AAI FMK#	NWS MOD	Description.	Status
001		HYGROTHERMOMETER (1088) FIRMWARE CHANGE TO VERSION A91H 1088: Firmware changed from A91F to A91H (transmit logic card swapped out)	Completed
001B	9	HYGROTHERMOMETER (1088-20) FIRMWARE CHANGE TO VERSION A92 1088: Firmware changed (EPROM marked A92) issued with transmit logic card	In Progress
002		LEDWI FIRMWARE UPGRADE TO VERSION 3.49 LEDWI: Firmware upgrade to version 3.49	Completed
002B	5	PRESENT WEATHER SENSOR FIRMWARE UPGRADE (VERSION 3.61) Present Weather Sensor: Replace main processor card.	In Progress
002C		PRESENT WEATHER SENSOR FIRMWARE UPGRADE (VERSION 3.62) Present Weather Sensor: Firmware upgrade to version 3.62	Planned
003		CEILOMETER EPROM (VERSION 2.46) & NEW MICROPROCESSOR Ceilometer: Replace EPROM U3 with version marked 2.46 & new microprocessor	Completed
004		WIND SENSOR FIRMWARE UPGRADE (VERSION 2.05) Wind Sensor: Replace EPROM with version marked 2.05	Completed
004B		WIND SENSOR FIRMWARE UPGRADE (VERSION 2.06) Wind System: Replace EPROM with version marked 2.06, approved, being installed until 2.07	Completed
004C	8	WIND FIRMWARE (VERSION 2.07) Wind System: Replace EPROM with firmware version 2.07	In Progress
005		H083 ELECTRONICS ENCLOSURE NAMEPLATE CHANGE Hygrothermometer (H083): Correct nameplate on the electronics enclosure from 1088-204 to 1063-200R	Completed
006		ACU/DCP IN-LINE CONNECTOR INSTALLATION DCP: Install in-line connectors on RF switches and heater behind battery (Class II sites only)	In Progress
007		ACU MICROVOICE PROCESSOR MICROCIRCUIT REPLACEMENT ACU Microvoice PCB: Remove & replace U23 microcircuit on ACU CCA 62828-47006-10	Completed

008	VISIBILITY SENSOR TRANSMITTER/RECEIVER LENSES DRILL HOLE IN ELECTRONICS ENCLOSURE Visibility Sensor: Install lens modifications and electronics enclosure holes	Completed
009	ACU GROUNDING CABLE INSTALLATION ACU cabinet: Ground wire installation	Completed
010	ACU MODEM ADAPTER & PHONE FILTER INSTALLATION ACU: Install modem adapter at 1A3 (any open pos), install phone filter at any open pos in I/D panel	Completed
011	VISIBILITY ENCLOSURE UPDATE Visibility Enclosure: Remove & replace regulator board & backplane assembly in the visibility enclosure	In Progress
012	VISIBILITY 1/4 AMP FUSE Visibility Sensor: Replace 1/8 amp fuse and relabel	In Progress
013	1088 CALIBRATION DECAL Hygrothermometer (1088-20): Put new calibration decal on sensors ser# T0048-65 with 1088-400 aspirator	Completed
014	DCP FIRMWARE UPGRADE (VERSION 1.7) DCP: Replace memory card with one which has new version 1.7 EPROM	Completed
015	ACU MEMORY FIRMWARE UPGRADE (VERSION 1.7) ACU: Replace memory card with card that has EPROM marked 1.7	Completed
015A 1	ACU MEMORY FIRMWARE UPGRADE (VERSION 1.8) ACU: Firmware upgrade to version 1.8; replace EPROM with version marked 1.8	Completed
015B	ACU MEMORY FIRMWARE UPGRADE (VERSION 1.9) ACU firmware upgrade to version 1.9; replace EPROM with version marked 1.9	Completed
015C 7	ACU MEMORY FIRMWARE UPGRADE (VERSION 2.0) ACU: Memory card firmware upgrade to version 2.0	In Progress
015D	ACU MEMORY FIRMWARE UPGRADE (VERSION 2.1) ACU: Memory card firmware upgrade to version 2.1	Planned
016	PRINTER REPLACEMENT Printer: Replace Canon BJ-80AS with Panasonic KX-1180I	Completed
017	VERIFY MEASURED VOLTAGE ON SOLA TRANSFORMER ACU: Measure voltage of Sola transformer	Completed

018		ACU MEMORY FIRMWARE UPGRADE (VERSION 1.4) ACU: Firmware upgrade to version 1.4	Completed
019	11	FREEZING RAIN SENSOR INSTALLATION Freezing rain sensor installation (62828-90115)	In Progress
020		ROTATE VISIBILITY SENSOR FIBER OPTIC MODEM Visibility Sensor: Rotate modem 180 degrees in existing position	Completed
021	9	HYGROTHERMOMETER ELECTRONICS ENCLOSURE AND ASPIRATOR REPLACEMENT Hygrothermometer: Electronics and aspirator chgs; calibration board and transmit logic card chgs	In Progress
022		ACU/DCP LINE DRIVER INSTALLATION ACU & DCP line drivers installation	Completed
023		ACU MEMORY BOARD BATTERY CHECK ACU: Memory board battery voltage measurement	Completed
024		VISIBILITY & LEDWI HINGE PLATES Visibility & LEDWI: Sensor hinge installation (PN 62828-40130-10)	Completed
025		CEILOMETER HINGE PLATES Ceilometer: Hinge installation (PN 62828-40130-10)	Completed
026		DCP EMI GASKET INSTALLATION DCP: Install gasket kit (62828-90017-20)	Completed
027	3	ACU PRESSURE SENSOR THRESHOLD DETECTOR (CLASS 1 SITES) ACU: Install external threshold pressure detector, PN 347501 (detector) at Class I sites	In Progress
028	4	BATTERY BOX UPDATE ACU & DCP: Battery box changes. Seat connector on battery box lid with RTV	In Progress
029	13	VISIBILITY SENSOR FIRMWARE (VERSION 036) Visibility sensor firmware upgrade to version 036	In Progress
030		VIDEO CARD INSTALLATION ACU Video Card installation	Completed
031	1	ACU CPU FIRMWARE UPGRADE (VERSION 1.8) ACU: Firmware upgrade to version 1.8	In Progress
032	8	WIND SENSOR BEARING EXCHANGE Wind System: Bearing exchange	In Progress

033	2	RAIN GAUGE THERMOSTAT Rain Gauge: Thermostat change	Completed
034		RS422 EXCHANGE RS422 update	Planned
035		PRINTER REPLACEMENT Printer: Replacement of Panasonic KX-P1180 with KX-P2180	In Progress
036	8	DRILL HOLE IN CROSS-ARM ADAPTERS & F/W VERSION 2.07 Wind System: Drill cross-arm adapter holes and install firmware upgrade version 2.07	In Progress
037	6	DCP CEILOMETER CIRCUIT BREAKER REPLACEMENT DCP: Replace 6 AMP circuit breaker with 10 AMP breaker	In Progress
038	4	ACU BATTERY BOX LID ACU: Battery box lid replacement	In Progress
039	8	WIND SENSOR CROSS-ARM BRASS ADAPTERS Wind System: Cross-arm brass adapter installation	In Progress
040		RAIN GAUGE STOP CLEANING Rain Gauge: Clean rain gauge stop to improve sensor reporting accuracy	Planned
041		ADDING DC4 TO WIND TOWER CONNECTOR Wind System: Apply DC-4 to wind tower cross-arm cable connector	In Progress
042	13	VISIBILITY CABLE DRESSER Visibility Sensor: Shield insertion into sensor cross-arm housing to restrain the cables	Planned
043		RAIN GAUGE BASE PLATE REPLACEMENT Rain gauge: Base plate replaced with larger base plate	Planned
044		DTE ADAPTER CABLE Convert the ACU from a DCE to a DTE interface	Planned
045		INSTALLATION OF SI0-5 BOARD ACU: Installation of additional SI0-5 board	Planned
046		ADAS MODIFICATION ACU and GTA radio cabling differences will be corrected in the standalone cabinet	In Progress
047		RAIN GAUGE FUNNEL EXTENSION Rain Gauge: Funnel spout extension added to improve accuracy	Planned

048	12	9600-BAUD MODEM INSTALLATION 9600-baud modem installation	Planned
049		WIND SKIRT ATTACHING HARDWARE Rain gauge wind skirt upgrade	Planned
050		T/B INSTALL REED SW AND FUNNEL EXTENSION Rain gauge reed switch installation	Planned
051		GTA RADIO GTA Radio installation	Planned
052		CODEX MODEM Codex modem installation	Planned
18886		ACU/DCP MOTOROLA RADIO INSTALLATION ACU & DCP Motorola radio installation	In Progress

ASOS ERRATA SHEET 1 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM

Errata to ASOS Modification Note 15

GENERAL

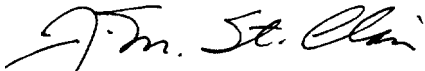
This errata sheet provides an updated ASOS Modification Index for EHB-11, Volume 2, Section 3.6. This index was to be included with ASOS Modification Note 15.

PROCEDURE

Remove and replace the index sheet in EHB-11, Volume 2, Section 3.6 with the attached index.

EFFECT ON OTHER INSTRUCTIONS

None.



J. Michael St. Clair
Chief, Engineering Division

Attachment

ASOS ERRATA SHEET 2 (for Electronics Technicians)

Engineering Division

W / O S O 3 2 1 : B G M

Errata to ASOS Modification Note 15

G E N E R A L

This, errata sheet provides a replacement page for appendix A. An update to the, ACU, SIO board (RS232) jumper configuration table in Appendix A, page A3, is the reason for replacing the page.

PROCEDURE

Remove and replace Appendix A, pages A1 and A2, printed back-to-back, in EHB-11, Volume 2, Section 3.6, with the attached index.

EFFECT ON OTHER INSTRUCTIONS

None .



J. Michael St. Clair
Chief, Engineering Division

Attachment

Instructions Field Modification Kit PORT SHARING DEVICE

PARTS LIST

<u>PART NUMBER</u>		<u>NOMENCLATURE</u>
62828-47028-20	1 ea	Memory board
62828-90197-6	1 ea	ABT adaptor
62828-90197-7	1 ea	RTA adaptor
62828-47014	1 ea	SIO board
62828-90148-1	1 or 2 ea	RS232 surge adaptor
62828-90206-2	6 ea	RJ45 connector
62828-90205-2	50 ft 8-wire	Telco cable
M24308/26-1	4 or 8 ea	Screw lock assembly
62828-40236-1	1 ea	NWS RTA label
62828-40237-1	1 ea	NWS ABT label
62828-40096-1	1 ea	ACU stuffing chart

NOTE: Two RS232 SIO ports are needed to install the port sharing device.
Install SIO board only if system does not have two unused RS232 ports.

PROCEDURE

1. On OID press REVUE SITE - CONFIG - COMMS. Are there two unused RS232 ports available?

NOTE: SIO #1 cannot be used for Port Sharing Device.

2. If there are, record the spare port locations (e.g., SIO5-3 & SIO5-4). If there are not two spare SIO ports available, an additional board will need to be installed; record how many SIO boards are currently installed in system.

3. SPARE SIO PORT 1. _____ 2. _____ No, SIO BOARDS. _____
ACU CLASS II SYSTEMS ONLY. Set output power switch on UPS status panel 1A4 to 0 (OFF).

4. Remove facility power from ACU.
5. Remove the blank panel from VME slot 1A2A4.
6. Remove IACK jumper from rear of VME backplane slot 1A2A4.
7. Install memory board P/N 62828-47028-20 in VME slot 1A2A4. Install jumper J34B on memory board before installing. See Site Technical Manual page 2-207.
8. Remove old stuffing chart from ACU front door and install new stuffing chart provided in FMK.

<i>Issue Date</i>	<i>Org. Code</i>
5-24-94	W/OS032

NATIONAL WEATHER SERVICE

Engineering Handbook

<i>Program</i>	<i>Part</i>	<i>Section</i>
EHB-11	03	3.6

MODIFICATION NOTES - AUTOMATED SURFACE OBSERVING SYSTEM

<u>Number</u>	<u>Date of Issue</u>	<u>Title</u>
1	February 23, 1993	Automated Observing System (ASOS) Software Version 1.8
2	March 10, 1993	Liquid Precipitation Accumulation Sensor Cutoff Thermostat Installation
3	March 16, 1993	Installation of External Threshold Detector Power Supply for Setra Model 470
	May 26, 1993	Errata Sheet No. 1 to ASOS Modification Note 3 dated March 16, 1993
4	March 1993	Replacement Battery Box Lid for DCP (waiting for certification test)
5	April 30, 1993	Firmware Upgrade for Light Emitting Diode Weather Indicator (LEDWI)
6	June 25, 1993	Replacement Data Collection Platform (DCP) Circuit Breaker for the Ceilometer.
7	September 9, 1993	Automated Surface Observing System (ASOS) Software Version 2.0
8	September 22, 1993	Wind Sensor Assembly Upgrades
9	September 23, 1993	Temperature/Deepened Electronics Enclosure and Aspirator Assembly Replacement
10	April 8, 1994	ACU Software Version 2.1
Addendum	June 8, 1994	The addendum provides additional information learned after the modification note was published.

<i>Issue Date</i>	<i>Org. Code</i>
5 - 2 4 - 9 4	W/OS032

NATIONAL WEATHER SERVICE Engineering Handbook

<i>Program</i>	<i>Part</i>	<i>Section</i>
EHB- 11	03	3. 6

MODIFICATION NOTES - AUTOMATED SURFACE OBSERVING SYSTEM

<u>Number</u>	<u>Date of Issue</u>	<u>Title</u>
11	On Hold	Automated Surface Observing System (ASOS) Freezing Rain Sensor (pending ECP approval)
12	April 15, 1994	Installation of the 9600-baud modem(s) Model V.3225
Errata Sheet 1	May 5, 1994	Replacement Page for ASOS Modification Note 12
13	June 9, 1994	Installation instructions for replacing EPROM on visibility processor board.
14	June 9, 1994	Software Version 2.0 for Voice Processor board 1A2A20
15	June 10, 1994	Installation of Port Sharing Device Memory Board
16	May 5, 1994	Deactivation of Hygrothermometer Autobalance Module
17	May 18, 1994	Deactivation of Hygrothermometer Fan Fail Circuit

ASOS MODIFICATION NOTE 16 (for Electronics Technicians)

Engineering Division

W/OS031: MGC

SUBJECT : Deactivation of Hygrothermometer Autobalance Module

PURPOSE : Improper operation of the autobalance system results in autobalance values that are too high. The high values result in erroneous dirty mirror diagnostic and mirror icing. This is an interim modification to reduce the number of false alarms. Correction of the autobalance problem is underway and, when completed, the autobalance will be reactivated.

EQUIPMENT AFFECTED: ASOS

PARTS REQUIRED : None

MOD PROCUREMENT : N / A

SPECIAL TOOLS : None

TIME REQUIRED : 1 hour

EFFECT ON OTHER INSTRUCTIONS : This modification must be done concurrently with Modification 17. Ignore all ASOS Site Technical Manual Instructions regarding the fan fail circuit. Future revisions to the ASOS Site Technical Manual will reflect this change.

CERTIFICATION STATEMENT : This modification was tested for operational integrity in the Engineering Design Branch laboratory, the Silver Spring, MD ASOS site, and a Sterling, VA ASOS site.

GENERAL

This modification deactivates the autobalance in ASOS hygrothermometers by disconnecting the autobalance from the remainder of the electronics. The autobalance is to remain deactivated until further notice. The modification is to be done for all ASOS hygrothermometers. A separate modification note will be issued for existing station HO-83 hygrothermometers.

BEFORE DEACTIVATION OF AUTOBALANCE MODULE.

1. Call the AOMC at 1-800-242-8194. Inform the person who answers the phone at which office you will be deactivating the autobalance module. Confirm that AOMC will provide access to the site-specific data base.

2. For commissioned sites, get approval of the responsible MIC/OIC before starting deactivation. For non-commissioned sites, the el tech must coordinate with the site MIC/OIC before starting deactivation. You may deactivate on any day of the month if permission is granted and the restrictions in steps 3 and 4 are complied with.
3. **Commissioned Sites Only:** Do not start deactivation during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of those conditions is expected within 3 hours. These meteorological conditions will be defined by the responsible MIC/OIC.
4. Do not start deactivation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Although about 45 minutes should be sufficient, allow 1 hour to complete deactivation and restart ASOS.
5. Immediately before beginning work at NWS staffed sites, the MIC/OIC/observer will inform the tower and any other critical users that the hygrothermometer will be shut off (at unstaffed sites, the el tech will inform tower). He/She will alert towers using Controller Video Displays (CVD) and Operator Interface Devices (OID) to log off and shut down display power to avoid confusion. At commissioned sites only, download the following data to laptop using the direct command mode: 5-minute data (12 hrs.), SYSLOG information (24 hrs.), SHEF messages (24 hrs.), and any 2-hour archive files.
6. Do not begin the deactivation process, i.e., halt ASOS, until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.

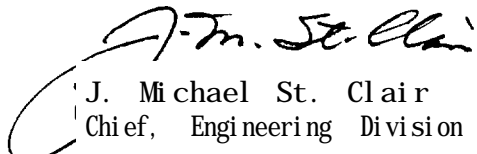
PROCEDURE

1. Follow normal procedures for maintenance and powering down the hygrothermometer.
2. Turn power to the hygrothermometer off at the DCP.
3. Locate the autobalance module A5. Disconnect the autobalance 9-pin, D-type connector J2. Restrain the plug by attaching one side to the mating connector. Replace the remaining screw and washer into the other side of the mating connector. See Figure 1 for details.
4. Turn power on to the hygrothermometer.
5. Clean the mirror and calibrate the optical loop using ASOS Site Technical Manual Procedures (reference chapter 5).
6. Follow normal procedures for returning the ASOS to normal operation.
7. Make appropriate entries in the SYSLOG using the Maintenance Action keys, Field Modification keys, and comment fields. Follow these steps:

1. Log on as TECH.
2. Key the MAINT screen.
3. Key the ACTION page.
- 3a. Press the Start Key.
- 3b. Exit, log off and complete the modification.
- 3c. Log on as TECH once the modification has been completed.
- 3d. Key the MAINT Screen.
- 3e. Key the ACTION Page.
4. Key FMK. Enter the Modification Note (MOD) number as: MOD 16.
On the second line of the screen verify that only MOD 16 is displayed. Complete by entering Y in the Y/N if only MOD 16 is displayed.
5. Check the SYSLOG and verify the FMK message. Notify the AOMC via telephone that MOD 16 is complete.

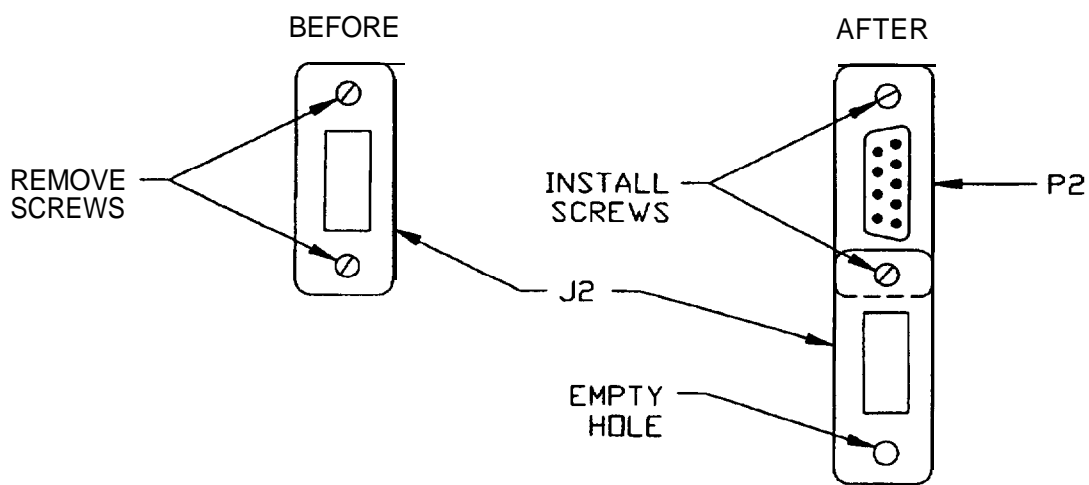
REPORTING MODIFICATION

This modification is critical and should be implemented as soon as possible. Target date for completion of this modification is 20 days after receipt of this note. Report completed modification on WS Form H-28, Engineering Progress Report, for each system, according to instructions in EHB-4, part 2, using reporting code ASOS.


J. Michael St. Clair
Chief, Engineering Division

Attachment

AUTO BALANCE MODULE CONNECTOR



EHB11
MODIFICATION NOTE 16

FIGURE 1.

ASOS MODIFICATION NOTE 17 (for Electronics Technicians)

Engineering Division

W/OS031: MGC

S U B J E C T : Deactivation of Hygrothermometer Fan Fail Circuit

P U R P O S E : The voltages applied to the fan fail circuit on the dew point sensor assembly are causing rapid deterioration of the circuit lands in the vicinity of the fan fail temperature elements due to electrolytic action. The deterioration leads to erroneous calibration and simulated temperature diagnostics, incorrect temperature readings and, eventually, complete failure of the sensor. Additionally, the fan fail circuit has been found to be unreliable, generating false alarms of fan failure under certain conditions. This modification deactivates the fan fail circuit and its corrosion producing voltages.

EQUIPMENT AFFECTED: ASOS

PARTS REQUIRED : Tie wrap or tie cord
Indelible marker

MOD PROCUREMENT : Purchase tie wrap and marker locally.

SPECIAL TOOLS : None

TIME REQUIRED : 1 hour

EFFECT ON OTHER : This modification must be done concurrently with
INSTRUCTIONS Modification 16.

CERTIFICATION : This modification was tested for operational integrity
STATEMENT in the Engineering Design Branch laboratory, the Silver Spring, MD ASOS, and at Sterling, VA ASOS sites.

GENERAL

This modification note provides instructions to deactivate the fan fail circuit on all ASOS hygrothermometer dew point sensor assemblies. This note applies to all ASOS hygrothermometers including the refurbished H0-83's although the H0-83's do not use the fan fail circuit. The change is being done to all ASOS hygrothermometers to minimize the logistics impact. The fan fail deactivation is permanent. It will not be reactivated in its current configuration.

BEFORE DEACTIVATION OF FAN FAIL CIRCUIT

1. Call the AOMC at 1-800-242-8194. Inform the person who answers the phone at which office you will be deactivating the fan fail circuit. Confirm that AOMC will provide access to the site-specific data base.
2. For commissioned sites, get approval of the responsible MIC/OIC before starting deactivation. For non-commissioned sites, the el tech must coordinate with the site MIC/OIC before starting deactivation. You may deactivate on any day of the month if permission is granted and the restrictions in steps 3 and 4 are complied with.
3. **Commissioned Sites Only:** Do not start deactivation during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of those conditions is expected within 3 hours. These meteorological conditions will be defined by the responsible MIC/OIC.
4. Do not start deactivation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Although about 45 minutes should be sufficient, allow 1 hour to complete deactivation and restart ASOS.
5. Immediately before beginning work at NWS staffed sites, the MIC/OIC/observer will inform the tower and any other critical users the hygrothermometer will be shut off (at unstaffed sites, the el tech will inform tower). He/She will alert towers using Controller Video Displays (CVD) and Operator Interface Devices (OID) to log off and shut down display power to avoid confusion. At commissioned sites only, download the following data to laptop using the direct command mode: 5-minute data (12 hrs.), SYSLOG information (24 hrs.), SHEF messages (24 hrs.), and any 2-hour archive files.
6. Do not begin the deactivation process, i.e., halt ASOS, until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.

PROCEDURE

1. Follow normal procedures for ASOS maintenance and powering down the hygrothermometer.
2. Turn power to the hygrothermometer off at the DCP.
3. Remove the dew point sensor from the aspirator.
4. Using diagonal wire cutters, cut the two black wires and one white wire as shown in Figure 1. Cut the wires off flush with the board. For reference, these are the wires that connect to the junction and either end of the two fan fail temperature sensors.

5. Fold the cut wires back and secure to the aspirator cable using a tie wrap or tie cord.
 6. Stagger the three wires to offset the ends-from one another, so they cannot contact each other.
 7. Further secure the three wires to the cable, if necessary, to ensure that the ends of the wires do not contact any surfaces including the inside of the aspirator.
 8. Using water from the hygrothermometer cleaning kit and an acid brush, gently but thoroughly clean any corrosion products from the card in the area of the fan fail temperature elements and the ambient temperature RTD. This is the area between the thermoelectric cooler fins and the ambient temperature RTD. After the water cleaning, use alcohol and clean the area again. Examine the area and be sure that all corrosion and dirt have been removed. Repeat if necessary.
 9. Use an indelible marker to mark the card with a "B" as shown in Figure 1.
 10. Reinstall the dew point sensor into the aspirator.
 11. Turn the fan fail potentiometer fully counterclockwise.
 12. Turn power to the hygrothermometer on at the DCP.
 13. Perform the temperature and dew point calibrations in accordance with the Site Technical Manual. Do not perform the fan fail adjustments.
 14. Mark out the fan fail adjustment instructions located on the inside of the transmitter door.
 15. Perform other routine maintenance as required by local procedures.
 16. Return the ASOS to operational configuration using normal procedures.
- Note: Perform this modification to the spare sensor in the spare parts kit.
17. Make the appropriate SYSLOG entries (MAINT-ACT-FMK).

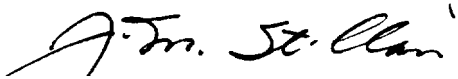
Make appropriate entries in the SYSLOG using the Maintenance Action keys, Field Modification keys, and comment fields. Follow these steps:

1. Log on as TECH.
2. Key the MAINT screen.
3. Key the ACTION page.
4. Key the Start Key.
5. Exit, complete modification installation.
6. Log on as TECH once modification has been completed.
7. Key the MAINT screen.

8. Key the ACTION page.
9. Key FMK. Enter the Modification Note number as follows: MOD 17 .
On the second line of the screen verify that only MOD 17 is displayed. Complete by entering **Y** in the Y/N if only MOD 17 is displayed.
10. Check the SYSLOG and verify the FM message. Notify the AOMC via telephone that MOD 17 is complete.

REPORTING MODIFICATION

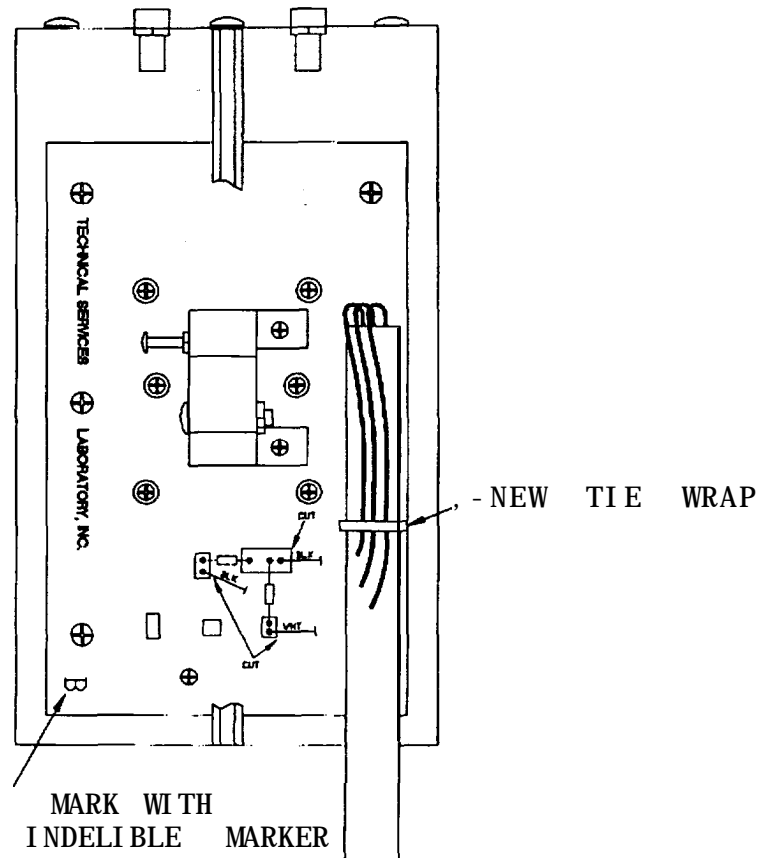
This modification is critical and should be implemented as soon as possible. Target date for completing this modification is 20 days after receipt of this note. Report completed modification on WS Form H-28, Engineering Progress Report, for each system according to instructions in EHB-4, part 2, using reporting code ASOS.



J. Michael St. Clair
Chief, Engineering Division

Attachment

DEW POINT SENSOR ASSY
(MIRROR/CABLE SIDE)



EHB11
MODI FI CATI ON NOTE 17

FIGURE 1

ASOS MODIFICATION NOTE 19 (for Electronics Technicians)

Engineering Division

W/OS0321: RWC/BGM

SUBJECT : Wind Sensor Assembly Upgrade, Model 2 Transmitters

PURPOSE : To add operational enhancements for the ASOS wind sensors

EQUIPMENT AFFECTED : ASOS

PARTS REQUIRED : Wind speed transmitter, Mod. 2, ASN S100-2A8MT1A2A1-1, (P/N 33079), qty. 1
Wind direction transmitter, Mod. 2, ASN S100-2A8MT1A3A1-1, (P/N 33080), qty. 1
Washer, ASN S100-2A8MT1A2MP3, qty. 2

MODIFICATION PROCUREMENT : Technicians will be issued one full set of the parts listed above for each ASOS site identified in the attachment (A-3). Additionally, each technician will be issued a set of spare mod. 2 transmitters for the spares kit.

SPECIAL TOOLS REQUIRED : None

TIME REQUIRED : 2 hours

EFFECT ON OTHER INSTRUCTIONS : ASOS Modification Note 8 is superseded.

AUTHORIZATION : This modification is authorized by Engineering Change Proposals E94SM05F108, E94SM05F110, E94SM05F111, E94SM05F114, and E94SM05F119.

VERIFICATION STATEMENT : It was successfully tested at the sites listed below:

ALB	ST1	FNT	SPI
ACY	IPT	PIA	GEG
BGM	ORH	RFD	
ERI	DTW	SUX	

GENERAL

This note provides procedures and instructions for upgrading the ASOS wind system. The current wind sensors will be upgraded with redesigned sensors designated ASN S100-2A8MT1A2A1-1, P/N 33079 and S100-2A8MT1A3A1-1; P/N 33080.

Enhancements to the sensors incorporate a new decorative nut sealing washer, an internal grounding strap attached to the direction potentiometer, wind speed optical chopper stabilizer, F420-shaped top design, and wind speed no. 6 set screw. The sensors have been modified to improve performance.

Integrated in this note are procedures for wind sensor crossarm brass adapter replacement. The brass adapter decreases the probability of the wind speed and direction transmitters seizing on the crossarm assembly. This procedure also provides guidance for drilling vent holes in both crossarm wind sensor adapters. These vent holes will help prevent moisture condensation that contributes to premature bearing failures and excessive torque on the wind sensors. Both of these optional activities may have been completed as part of Modification Note 8. If the vent holes have been drilled, then ignore those sections of this procedure.

PROCEDURE

Before and After Installation Procedures

Procedures Related to Installation of Wind Transmitters

BEFORE INSTALLING TRANSMITTERS

1. Obtain approval of the site MIC/OIC before starting installation. You may install on any day of the month if permission is granted and the restrictions in step 3 are complied with.
2. Call the AOMC at 1-800-242-8194. Inform the AOMC at which site you will be installing this modification.
3. **Commissioned Sites Only:** Do not start installation during bad weather, while precipitation is falling, during instrument flight rule (IFR) conditions, or if either is expected within 3 hours.

AFTER INSTALLING TRANSMITTERS

4. IF **MANUAL BACKUP IS AVAILABLE**, office staff must implement manual full backup observation procedures if installation runs past the regular hourly observation time, or if a special observation must be generated. No special observation is needed when the wind system is restarted.
5. Inform office staff that the ASOS is again operational.
6. Verify that the ASOS transmitted an hourly observation. Call the AOMC and tell them:
 - a. Your location,
 - b. that installation of the modification has been completed, and
 - c. that the ASOS is operational.

WIND SENSOR UPGRADE

1. At the DCP, turn the wind circuit breaker to OFF.
2. Carefully tilt the wind tower to the down position and secure. Cover the lightning rod to prevent accidental impalement.
3. Remove the wind speed sensor from crossarm support. Note: Cup nut is a left-hand thread. If the wind speed sensor cannot be removed from the crossarm, remove the whole assembly with transmitters as one piece. Replace the crossarm assembly with S100-2A8MT1A4 as described in the ASOS Site Technical Manual paragraph 4.5.17. Do not try to separate from the crossarm adapter. Inspect, connector P3 of cable P/N 32342, S100-2A8MT1W1, (tower signal cable) for corrosion. If it is corroded, replace tower signal cable. Cable may be obtained from NLSC.
4. Remove the wind direction sensor from the crossarm support. Note: Vane nut is a left-hand thread. If the wind direction sensor has seized and cannot be removed from the crossarm, remove the whole assembly with transmitters as one piece. Replace the crossarm assembly with S100-2A8MT1A4 as described in the ASOS Site Technical Manual paragraph 4.5.17. Do not try to separate from the crossarm adapter. Inspect connector P3 of cable P/N 32342, S100-2A8MT1W1, (tower signal cable) for corrosion. If connector is corroded, replace tower signal cable. Cable may be obtained from NLSC.
 - 4a. If the crossarm adapters have not been drilled with a drain hole, complete steps "a" through "g". Otherwise, proceed to step 5.
 - 4b. With a pencil, make a mark on the crossarm adapter keeping it clear of the connector's outside diameter (OD) and in line with the connector's alignment slot (see attached drawing, top view).
 - 4c. Loosen the two bolts securing the adapter into the crossarm. Loosen the two set screws securing the connector adapter and carefully pull the connector out of the adapter, taking care not to damage the wire bundle. Position and tape the connector/wire bundle clear of the pencil marked area.
 - 4d. Reassemble the adapter to the crossarm using the pencil mark for orientation.
 - 4e. Prepare to drill one 0.116 diameter hole in each crossarm adapter (be sure to use safety glasses).
 - 4f. Holding the drill at a 15 to 20 degree angle, drill the hole. (See the figure on page A-2). Penetration of the drill bit should be approximately 0.5 inch.

EHB-11
Issuance 95-5
4/27/95

4g. Reassemble the connector into the crossarm adapter after removing all tape and orienting correctly. When properly drilled, the hole should be clear of the connector's OD and in line with the connector's alignment slot. Reassemble the crossarm support using the Mod. 2 wind speed and wind direction sensors provided. Apply a very small amount of antiseize grease on the adapter. Do not apply grease near the newly drilled hole. Align the wind direction sensor using either the solar noon alignment procedure or the Davis Pelorus alignment procedure. (These procedures are in the ASOS Site Technical Manual paragraphs 4.5.2.5.1 and 4.5.2.5.2.)

5. Install the new sensor by aligning guide pins and connector on sensor with mounting holes and receptacle in crossarm supporting flange.

Install the sealing washer under the decorative nut on the direction and speed transmitters. Place the metal surface of the washer upright. When securing the nut to the shaft the metal surfaces of the bottom of the nut and sealing washer should come in contact. Tighten to ensure that the washer expands enough to cause a water tight seal. Incorrect orientation may cause damage to the washer.

6. Tighten each captive bolt.

7. Raise the wind tower and restore power to wind system.

(These procedures can be found in the ASOS Site Technical Manual paragraph 4.5.11.)

SHIPPING INSTRUCTIONS

After the modification has been accomplished, package the Mod. 1 wind sensors for shipment to NRC. Complete and attach a WS Form H-14 for each component you return. Items being returned should include ASN S100-2A8MT1A3A1 (Mod. 1 W/D transmitter), ASN S100-2A8MT1A2A1 (Mod. 1 W/S transmitter), and decorative nuts S100-2A8MT1A2MP1 (2 ea.)

REPORTING MODIFICATION

For commissioned sites, target date for completion of this modification is 7 days after receipt of parts. For other sites, target date for completion is 14 days after receipt of parts. Report completed modification on WS Form A-26, Maintenance Record, following instructions in EHB-4, Part 2. Use reporting code AWIND. (example WS Form A-26 provided as attachment.)

Make appropriate entries in the SYSLOG using the Maintenance Action keys, modification keys and comment fields for each Mod. 1 transmitter that is replaced. Follow the steps in the example below.

1. Log on as TECH.
2. Key the MAINT screen.
3. Key the ACTION page.

EHB-11

Issuance 95-5

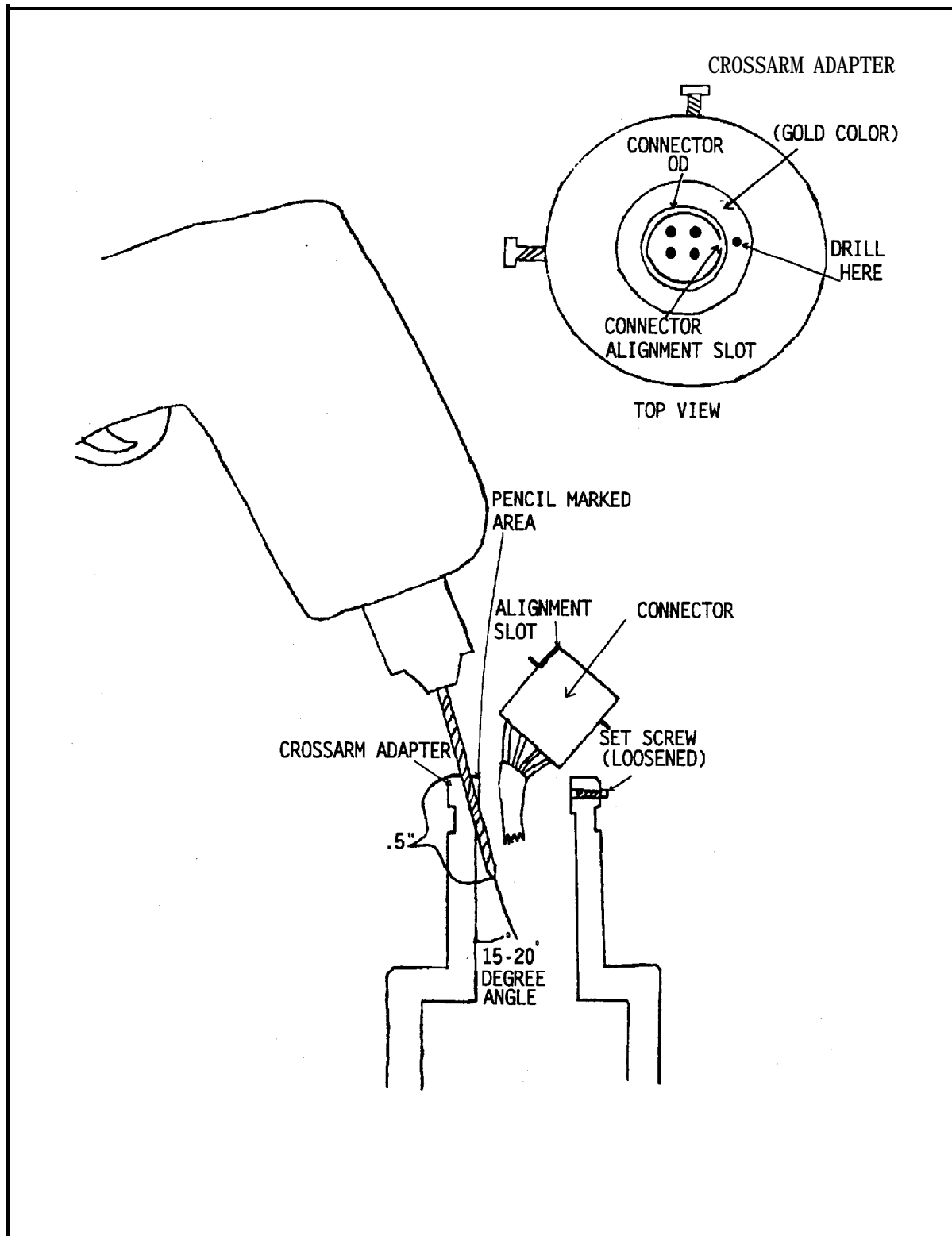
4/27/95

4. Key START - Stop here and perform the modification procedure. After the task is complete, log onto the system.
5. Key the MAINT screen.
6. Key the ACTION page.
7. Key FMK - the OI D will display the "Field Modification Kit Maintenance Data" page.
8. Enter the Field Modification Kit Number, MOD 19. Complete by entering Y in the Y/N if the information in the previous to lines is correct.
9. Key PREVT - the OI D will display the Preventative Maintenance Data page.
10. Enter the Agency Stock Number, S100-2A8MT1A3A1-1 (Mod. 2 wind direction transmitter). Repeat step 9 to enter wind speed transmitter data S100-2A8MT1A2A1-1 (Mod. 2 wind speed transmitter). Enter the serial number of the transmitter, .e.g., A0288. Complete by entering Y in the Y/N if the information in the previous lines is correct.
11. Check the SYSLOG and verify the FMK and two PREVT messages. Notify the AOMC via telephone when site modification has been completed.



J. Michael St. Clair
Chief, Engineering Division

Attachments



LISTING OF SIDs REQUIRING WIND SENSOR MODIFICATION NOTE 19

07S	0A6	1S4	21A	22G	2B6	2V3	39J	3KM	3R5
3S2	3SM	3U6	47C	5B5	5C0	6R0	6V2	7G2	7MY
81J	9B9	A21	ABR	ACT	ACY	ADG	ADQ	AFN	AGS
AI A	AKN	AK0	ALB	ALS	ALW	AMA	AMW	ANC	AOH
APN	ARA	ARB	ARR	AST	ATL	ATY	AVX	AXN	AZO
B20	BDE	BEH	BFD	BFF	BFM	BGD	BGM	BHM	BIL
BIS	BI X1	BI X2	BI X3	BJJ	BKV	BLF	BLU	BMG	BML
BPI	BPK	BRD	BR0	BTL	BTM	BTR	BTT	BUY	BVO
BWG	BYG	BZN	C19	CAE	CAG	CDB	CDS	CEU	CFV
CGI	CKB	CKV	CLE	CLM	CNK	CNU	COS	COU	CPS
CQX	CRS	CRW	CSG	CSM	CX0	CYS	DAB	DCU	DDC
DEC	DET	DFI	DGW	DHN	DHT	DKK	DLN	DMO	DNL
DRO	DSM	DSV	DTN	DT0	DTW	DVN	DVX	E02	ELM
ELN	ELY	EMP	ENA	ENW	EPH	ERI	ESF	EST	EVV
EVW	EWB	EWN	F54	F90	FAI	FCA	FDR	FFC	FFT
FHR	FIT	FLD	FNT	FOE	FOK	FSD	FST	FVE	FWA
GAG	GCK	GCN	GEG	GEY	GIF	GKN	GLD	GLR	GOK
GRB	GRI	GRR	GSH	GTF	GVL	GWO	HA0	HBG	HBR
HDO	HEI	HFD	HIE	HKA	HKS	HLG	HLN	HOM	HON
HOT	HRO	HSI	HSV	HTL	HUF	HUT	HVN	HVR	HWV
HYR	I 14	I 15	ICT	I JD	IMT	I OW	I PT	I SW	I TO
IXD	JAN	JAX	JBR	JEF	JKL	KNFJ	KNJW	KNMM	KOA
KOLA	KOLW	KTN	LAA	LAN	LAW	LBT	LEE	LEX	LGU
LHX	LI H	LI T	LNK	LOU	LOZ	LVM	LWC	LWS	LWV
MO6	M50	M76	MAE	MA1	MBS	MCB	MCG	MCI	MCK
MCN	MCO	MEB	MEM	MFD	MFI	MGM	MGW	MGY	MHK
MI C	MI W	MKE	MKG	MKL	MKO	MLC	MLI	MLS	MLT
MLU	MMV	MNN	MPV	MRH	MRI	MSL	MSN	MS0	MTH
MTJ	MT0	MVL	MWH	NO0	N22	N63	N80	N97	NED
NEXC	018	045	OFP	OGB	OGG	OJC	OKC	OLF	OLM
OMK	ONO	ORE	ORH	ORT	OVE	PADK	PAH	PAQ	PBF
PBI	PDT	PGD	PHBK	PHD	PHNA	PHX	PI A	PI R	PKD
PLB	PLN	PNC	PPF	PSC	PTK	PTW	PUB	PUW	PWA
PWM	PYM	RAC	RBG	RFD	RHI	RIL	RKP	RSL	RVS
RZZ	S22	SAV	SBM	SBN	SCC	SCK	SDF	SEG	SFF
SGF	SIT	SLK	SLN	SMF	SMP	SMX	SNY	SOV	SPI
SPS	SPW	STC	STJ	STP	SUX	SWD	SWO	SXT	SYR
T02	T27	T31	T39	TAL	TAN	TCL	TDZ	THV	TLH
TMB	T01	TOP	TOR	TQE	TRL	TUL	TUP	U11	U73
UCA	UN0	VEL	VPZ	VSF	W52	WLD	WI	X41	YKM
YNG	ALO	ASX	BI H	BPT	CLL	CM	COT	CRP	DBQ
DRA	HKS	IAH	INL	INW	KNQI	KNUQ	KNYL	LBX	MRY
OMA	RBL	RDD	RNO	RST	SLE	SAT	TPH	VTN	

WS HQ USE ONLY		WS FORM A-26 (4/94) <small>Supersedes WS Form A-23 and WS Form H-28, which are obsolete</small>				U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION <small>WINDSPEED MEASUREMENT SYSTEM</small>		Document Number			
ENGINEERING MANAGEMENT REPORTING SYSTEM											
General Information		1. Open Date 10/17/94		Time 1200		2. Initials R W C		3. Response Priority (Check one) <input type="radio"/> Immediate <input type="radio"/> Low <input type="radio"/> Routine <input type="radio"/> Not Applicable		4. Close Date 10/17/94	Time 1500
5. Description Wind Sensor Modified in accordance with mod note #19.											
Equipment Information		6. Station ID PBI		7. Equipment Code AWIND		8. Serial Number 04321		9. TM M		10. AT M	11. How Mal. 999
12. EQUIPMENT OPERATIONAL STATUS TIMES		a. Fully Operational						Not Operational e. All Other <div style="border: 1px solid black; padding: 2px; display: inline-block;">3:00</div>			
13. Parts Failure Information										14. Work Load Information	
Block #	ASN	b. NSN	c. TM	d. AT	e. How Mal.	f. Qty.	g. Maint. Hrs.	Type	Staff Hrs.		
1	S100-2ASMT1A2A1	6660-AS-200-0045-X	M	R	999	1	1:30	a. Routine			
2	S100-2A8MT1A3A1	6660-AS-200-0044-X	M	R	999	1	1:30	b. Non-routine			
3								c. Travel			
4								d. Misc.	003:00		
5								e. Overtime			
Miscellaneous Information		15. Maintenance Comments OID terminal blanks out when bumped. Replaced terminal.								16. Initials RWC	
17. SPECIAL PURPOSE REPORTING		a. Mod. No. 19	b. Mod./Act./Deact./Date 10/17/94		c.		d.		e.		
18. CONFIGURATION MGMT. REPORTING (use as directed)		a. Block # 1 2	b. Manufacturers Part No. of New Part S100-2A8MT1A2A1-1 S100-2A8MT1A3A1-1					c. Revision No. of New Part A0288 A0388			

ASOS MODIFICATION NOTE 20 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM/AJW

SUBJECT : ACU Memory Firmware Version 2.2 and ACU CPU Firmware 1.81

PURPOSE : To add GS-200 communication enhancements for the ASOS

EQUIPMENT AFFECTED: ASOS Acquisition Control Unit (AACU)

PARTS REQUIRED : CPU Microcircuit P/N 62828-45000-1
CPU Microcircuit P/N 62828-45001-1
ACU Memory Microcircuit P/N 62828-45002-1
ACU Memory Microcircuit P/N 62828-45003-1
ACU Memory Microcircuit P/N 62828-45004-1
ACU Memory Microcircuit P/N 62828-45005-1

MOD PROCUREMENT : The above parts are available through NLSC as three separate EPROM sets. One set of CPU EPROMs for each ACU CPU, one set of ACU memory EPROMs, and one set of voice EPROMs are required. Technicians should order S100-1A2A20-U11 voice EPROMs, S100-1A2A1-U29 (order two sets for class II sites) ACU CPU EPROMs, and S100-1A2A3-U8, version 2.2 ACU memory EPROMs for each site listed in Appendix E. Return old EPROMs to NRC.

SPECIAL TOOLS REQUIRED : IC insertion tool
Small flat blade screwdriver
Conductive foam
Electrostatic discharge (ESD) straps

TIME REQUIRED : 1 hour

EFFECT ON OTHER INSTRUCTIONS : EHB-11, section 3.6, Modification Notes 14 and 15 are to be installed in conjunction with this modification. Modification Note 10 and the errata are superseded by this modification note. Software change descriptions in appendixes D, E, and F of Modification Note 10 still apply. Remove Modification Note 29, if installed, before starting this modification.

AUTHORIZATION : This modification is authorized by ECP E94SM05F120.

VERIFICATION STATEMENT : This modification has been tested for operational integrity at the sites listed in Appendix B and the Engineering Design Branch laboratory.

GENERAL

This modification note provides procedures to upgrade the ASOS software by removing and replacing erasable programmable read only memory (EPROM). This note provides procedures for "Before Installing Firmware" and "After Installing Firmware." Appendix C, attached to this note, contains information on changes and corrections implemented in firmware version 2.2. Before installing Modification Note 20, reference EHB-11, section 3.6, ASOS Modification Notes 10, 14, and 15. The voice processor firmware, Modification Note 14 is required to be installed in conjunction with this modification.

PROCEDURE

Follow installation instructions for EPROMs U8, U7, U17, and U21 on the ACU memory board 1A2A3, and EPROMs U29 and U30 on the ACU CPU boards 1A2A1 and 1A2A2.

CAUTION

Be careful to protect the electronics on the ACU memory and CPU boards during this procedure. Do not reconfigure any jumpers on the ACU memory or the ACU CPU boards unless instructed to do so by the procedure.

BEFORE INSTALLING FIRMWARE

1. Call the AOMC at 1-800-242-8194 and provide notification on which ASOS you will be installing new firmware. Confirm that the AOMC will provide access to the site-specific data base. Coordinate with the AOMC so the data base is available. Upload current configuration before installing the new firmware.
2. Get approval of the responsible MIC/OIC before starting installation. You may install on any day of the month if restrictions in steps 3 and 4 are satisfied.
3. Commissioned Sites Only: Do not start installation during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of these conditions are expected within 3 hours. These meteorological conditions will be defined by the responsible MIC/OIC.
4. Do not start firmware installation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Although about 45 minutes should be sufficient, allow one hour to complete installation and restart ASOS.
5. Immediately before beginning work at NWS staffed sites, the MIC/OIC/Observer will inform the tower and any other critical users that ASOS will be shut off for firmware upgrade. At an unstaffed site the el tech

will inform the tower using Controller Video Displays (CVD) and Operator Interface Devices (OID) to log off and shut down display power to avoid confusion. Commissioned sites only, are to download the following data to the laptop using the direct command mode: 5-minute data (12 hrs.), SYSLOG information (24 hrs.), SHEF messages (24 hrs.), and any 2-hour archive files.

6. Do not begin the installation process, i.e., halt ASOS, until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.
7. Disable all hardware and dial communication ports to AFOS (REVUE-SITE-CONFIG-COMMS). GO into the AOMC page (REVUE-SITE-VERSION-AOMC); wait for the external communication and the site physical lines to change from "AUTO UPLOAD REQ" to "COMPLETE" before going to the next step. The system voice function will automatically broadcast a "not available" message when the ACU power is turned off.
8. Make the appropriate SYSLOG entries (MAINT-ACT-FMK) Mod 20
 1. Log on as **TECH**.
 2. Key the **MAINT** screen.
 3. Key the **ACTION** page.
 4. Key **START** - Stop here and preform Mod 20.
9. Continue with Appendix A, Instructions for ASOS Software Version Upgrade. Once the steps in Appendix A have been completed, continue with "After Installing Firmware," step 10.

AFTER INSTALLING FIRMWARE

See page 4 for a description of the time required to reboot ASOS and sensor response time after a new firmware load.

10. When ASOS is restarted at unstaffed sites, call to inform towers using CVDs and OIDs to turn on their displays. (At staffed sites, the MIC/OIC observer will call the tower.)
11. If on-site NWS staff provides backup while the installation is underway, no special observation is needed when ASOS is restarted. Proceed to step 12.

If there is no backup at a site and a record observation was missed during the installation, a special observation must be taken when ASOS is restarted. The el tech should take the following steps at the ASOS keyboard after installation:

1. Press [SIGN].
2. Type his/her initials and press [RETURN]
3. Type the observer level password and press [RETURN].
4. Press [GENOB].
5. Press [SPECL].
6. Press [EXIT].

7. Press [SIGN]
8. Type his/her-initials again and press [RETURN].
9. Press [RETURN] twice. This signs the "observer" off ASOS.
10. Leave ASOS running.

Note: The "observer" must sign off before the 5-minute edit time is up.

12. Inform the office staff that ASOS is again operational. If less than 25 minutes remain until the next hourly observation, augmentation of the ceiling may be required. It might also be necessary to augment several elements or even the entire observation. The chart below indicates how long it takes after a start up for ASOS to report each observation element automatically.

Times Needed for Elements to be Reported Automatically

	<u>Minimum</u>	<u>Maximum</u>
Pressure	60 seconds	10 minutes
Precipitation Amount	60 seconds	*
Wind direction	2 minutes	7 minutes
Wind speed	2 minutes	7 minutes
Precipitation Type	2 minutes	*
Temperature	5 minutes	10 minutes
DewPoint	5 minutes	10 minutes
Visibility	10 minutes	15 minutes
Obstruction to Visibility	10 minutes	*
Ceiling	30 minutes	35 minutes

* Maximum time not applicable since phenomena may not be present.
Minimum time applies if phenomena are present.

13. Verify that ASOS transmitted an hourly observation. Call the AOMC at 1-800-242-8194 and tell the operator:
 1. Your location.
 2. That installation of the new firmware has been completed.
 3. That ASOS is operational.
14. Enter in the SYSLOG that maintenance has been completed.
 1. Key the **MAINT** screen.
 2. Key the **ACTION** page.
 3. Key **FMK** - Enter the Field Mod Kit (FMK) number as follows: **Mod 20**
On the second line of the screen verify that only mod 20 is displayed. Complete by entering Y in the Y/N if only mod 20 is displayed. If mods 14 and 15 were completed, make appropriate log entries.
 4. Check the SYSLOG and verify the **FMK** message. Notify the AOMC via telephone that mod 20 and any other mods have been completed.
15. At an expansion site with ATCT, the el tech will contact the ATCT and supply information on the following:

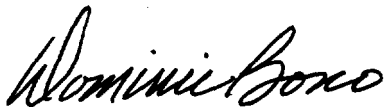
1. ASOS maintenance is completed.
2. ASOS is restored to service.
3. Tower CVDs and OIDs need to be turned on, and TRACON displays need to be turned on.

Reporting Modification

Target date for completion of this modification is 30 days after receipt of parts. Report completed modification on a Weather Service Form A-26 maintenance record, per instructions in EHB-4, Part 2, Appendix F, using reporting code AACU. An example provided in Appendix D. If this modification is installed in conjunction with Modification Notes 14 and/or 15, a separate Weather Service Form A-26 must be completed for each modification note.

NOTE:

Parts removed (EPROMS) should be returned to NRC as S100-FMK015D.0LD. NRC will be reprogramming the EPROMs for other ASOS applications.



Acting Chief, Engineering Division

Appendix A
Appendix B
Appendix C
Appendix D
Appendix E

INSTRUCTIONS

FIELD MODIFICATION KIT - ASOS SOFTWARE VERSION UPGRADE

1. UPGRADING ASOS SOFTWARE

1.1 GENERAL

All ASOS application software is contained on the four erasable programmable read only memory (EPROM) integrated circuits (IC) on ACU memory board 1A2A3. Figure 1 illustrates the ACU memory board and identifies the four EPROMs (U8, U17, U7, and U21). The EPROMs are 32-pin dual in-line package (DIP) CMOS devices, each providing 512K x 8 bits of storage. Upgrading ASOS software requires only replacing the four EPROMs on the ACU memory board with higher revision level ICs.

All pSOS ASOS application software is contained on the four EPROM ICs on the ACU CPU board 1A2A1 and 1A2A2. Figure 2 illustrates the ACU CPU board and identifies the two EPROMs (U29 and U30). The EPROMs are 28-pin DIP CMOS devices, each providing 256K x 8 bits of storage. Upgrading pSOS ASOS software requires only replacing the two EPROMs on the ACU CPU board with higher revision level ICs.

The four EPROMs on the ACU memory board contain both the ACU application program and the DCP application program. The ACU CPU runs the ACU application program directly from the ACU memory board. The DCP application program must first be downloaded from the ACU memory board to RAM storage in the DCP before it can be run by the DCP CPU.

Sites without a local OID (i.e., no RS232 connected for the primary OID) should attach a terminal to the primary OID port of the ACU 1A9J22 before proceeding.

1.2 SOFTWARE UPGRADE PROCEDURE

This procedure provides instructions to upgrade ASOS software by removing and replacing the four EPROMs on the ACU memory board and two EPROMs on each of the ACU CPU boards. After new EPROMs are installed, this procedure cold starts both the ACU and associated DCPs.

If the ACU EPROMs in the system are 1.70 or higher, the ACU is no longer cold started by removing battery jumper J22 (Figure 1) to clear all RAM on the board. The next step requires receiving a download of site-specific data from the AOMC. The DCPs are cold started by performing a hard reset of each DCP from the processor status page on the OID. After completion of the upgrade procedure, the EPROMs removed from the ACU memory board should be packaged in appropriate electrostatic discharge (ESD) protective material for return.

NOTE:

There may be an approximate 20-minute wait required to access the AOMC.

Tools and Materials Required: IC insertion tool
Small flat bladed screwdriver
Conductive foam
ESD strap

Step

1. If printer is on-line, remove it to off-line by pressing the **ON-LINE** switch located on the printer front panel.

CAUTION

Damage to equipment may result if power is not removed prior to removal or installation. Ensure that OUTPUT POWER switch is set to 0 (off) and facility power is removed.

To avoid damage to circuit boards and integrated circuits, use proper ESD handling procedures, including using a grounding strap when performing the following steps.

2. Set OUTPUT POWER switch on UPS status panel to 0 (off) position. The indicator for the OUTPUT status panel extinguishes.
3. Remove facility AC power from ACU cabinet.
4. Using a small flat blade screwdriver, loosen the captive screws located at top and bottom of ACU memory board 1A2A3 and loosen captive screws located at top and bottom of the ACU CPU boards 1A2A1 and 1A2A2.
5. Press extractor handles at top and bottom of ACU CPU boards 1A2A1 and 1A2A2 and ACU memory board 1A2A3 in opposite directions to release board. Remove board from rack.
6. On underside of the ACU memory board, using a flat blade screwdriver, remove three screws and flat washers securing front panel to board. Remove board from front panel.
7. If the ACU EPROMS in the system are 1.70 or higher proceed to step 8, otherwise continue with step 7.
Remove battery jumper J22 from ACU memory card. Jumper will be reinstalled during the installation procedure.

CAUTION

Throughout this procedure, discharge the screwdriver before and during use by touching tool to the grounded chassis surface.
Failure to comply may result in damage to the integrated circuits.

8. From the front of the board, slide small flat blade screwdriver between integrated circuit U7 and its IC socket. Carefully lift up on U7 to remove it from the socket as evenly as possible. After U7 is removed from the socket, place in a conductive foam or on some other static-free surface.
9. Repeat Step 8 for removal of the following integrated circuits U8, U17 and U21.
10. Remove U29 and U30 from the ACU CPU printed circuit boards 1A2A1 and 1A2A2 sockets and place the removed integrated circuits in a conductive foam or on some other static-free surface.
11. Using the IC insertion tool, remove the new EPROM ICs from protective packaging and insert them into the ACU memory board sockets in accordance with the following chart. Ensure that the EPROMs are installed with pin 1 (as identified by notch in top of IC) oriented toward board connector P1 and P2 as shown on Figure 1.

IC socket	IC part number
U8	62828-45002-1
U17	62828-45003-1
U7	62828-45004-1
U21	62828-45005-1

12. Use a small flat blade screwdriver, and install the three flat washers and screws. This will secure the front panel to the board.
13. Hold the ACU memory board by handles, position the board with the component side facing to the right and-carefully slide board into VME rack on its guides. Align the board with the rear connector and press into place.
14. Use a small flat blade screwdriver and tighten the captive screws located at top and bottom of board.
15. Remove the new EPROMs ICs from the protective packaging. Use an IC insertion tool to insert the EPROMs into the ACU CPU board's sockets (1A2A1 and 1A2A2) in accordance with the following chart. Ensure that all the EPROMs are installed with pin 1 (as identified by notch in top of IC) oriented toward the top of the ACU CPU board as shown on Figure 2

IC socket	IC part number
U29	62828-45000-1
U30	62828-45001-1

16. Holding the ACU CPU board by the handles, position the board with the component side facing to the right and carefully slide board into the card rack on its guides. Align the board with the rear connector and press into place.

17. Use a small flat blade screwdriver, and tighten the captive screws located at the top and bottom of the ACU CPU board.
18. This completes Modification Note 20. Complete Modification Notes 14 and 15 before going to step 19.
19. Apply facility power to ACU cabinet.
20. Set OUTPUT POWER switch to 1 (on) position
21. After the power is applied to the ACU, one of the PASS (Green) LEDs on the CPU should illuminate and the PASS LED on the other CPU will remain off. After approximately 1 minute, the LED that was off should start blinking.
22. Place the line printer on-line by pressing the **ON-LINE** switch located on the printer front panel. **ON-LINE** indicator illuminates.
23. With the power applied to the ACU and OID and after a brief warmup delay, the OID displays 1-minute data. If the display is not being updated, press the HELP key twice to refresh screen. The NEED SID AND AOMC PHONE message appears at top of screen. If this does not occur, return to REMOVAL procedure, step 1. Follow the steps until the ACU memory board is removed. Ensure the ACU EPROMs are installed correctly. Follow the INSTALLATION procedures to replace the ACU memory board.
24. At the OID, sign onto system as a "Technician."
25. Display the external communications page on the OID (sequentially press REVUE-SITE-CONFIG-EXTRN keys from 1-minute display). Enter the phone number of AOMC (1-800-253-4717) into the AOMC PHONE NUMBER field and press the EXIT function key.
26. Display the site physical page on the OID (sequentially press REVUE-SITE-PHYS function keys from 1-minute display). Enter the three or four character SID code in the STATION IDENTIFIER field and press the EXIT function key. The system then calls the AOMC and receives a download of site-specific data.
27. Display the AOMC version page on the OID (sequentially press REVUE-SITE-VERSN-AOMC function keys from 1-minute display). This will allow you to observe that all the files are being downloaded from the AOMC. status fields should read "COMPLETE" in approximately 5 minutes. Press EXIT.

NOTE: The following steps cold start the DCPs.

28. Display the maintenance page on the OID (press the MAINT function key from 1-minute display).

29. Use the PREV/NEXT keys, position the cursor over PROC field and press the SEL key. The OID displays the processor status page.
30. Use the PREV/NEXT keys, position the cursor over DCP #1 - HARD field and press the RESET key. Respond "YES" and "ENTER" to the "ARE YOU SURE?" message. The corresponding status field displays INITIALIZING while the unit is initializing. The progress of the download can be monitored by the PERCENT COMPLETE message that appears at the top of the screen. When the percent complete reaches 100, the DCP status field changes to RUNNING.
31. If the system contains more than one DCP, repeat step 19 for DCPs #2 and #3 as required.

FINAL ACTIONS

1. After the FMK has been completed, clear any maintenance flags that occur as a result of the restart.
2. Display the SW version page on the OID (sequentially press REVUE-SITE-VERSN-SW function keys from 1-minute display). The following fields should display version 2.2: MEMORY ACU APPLICATION EPROM, MEMORY DCP APPLICATION EPROM, and MEMORY DCP APPLICATION RAM (These fields may take 5-10 minutes before they all read 2.2.)
3. Technicians must enter the second AOMC telephone number (1-800-434-1133) on the external communications page. Technicians should also enter site identifications for each AFOS dial backup telephone number. SHEF addresses must be entered on the external communications page. Specific addresses can be obtained from the local MIC/OIC. AFOS backup block and the AOMC 1200 baud fields should be N, for all sites in the conus.

ASSEMBLY DRAWING

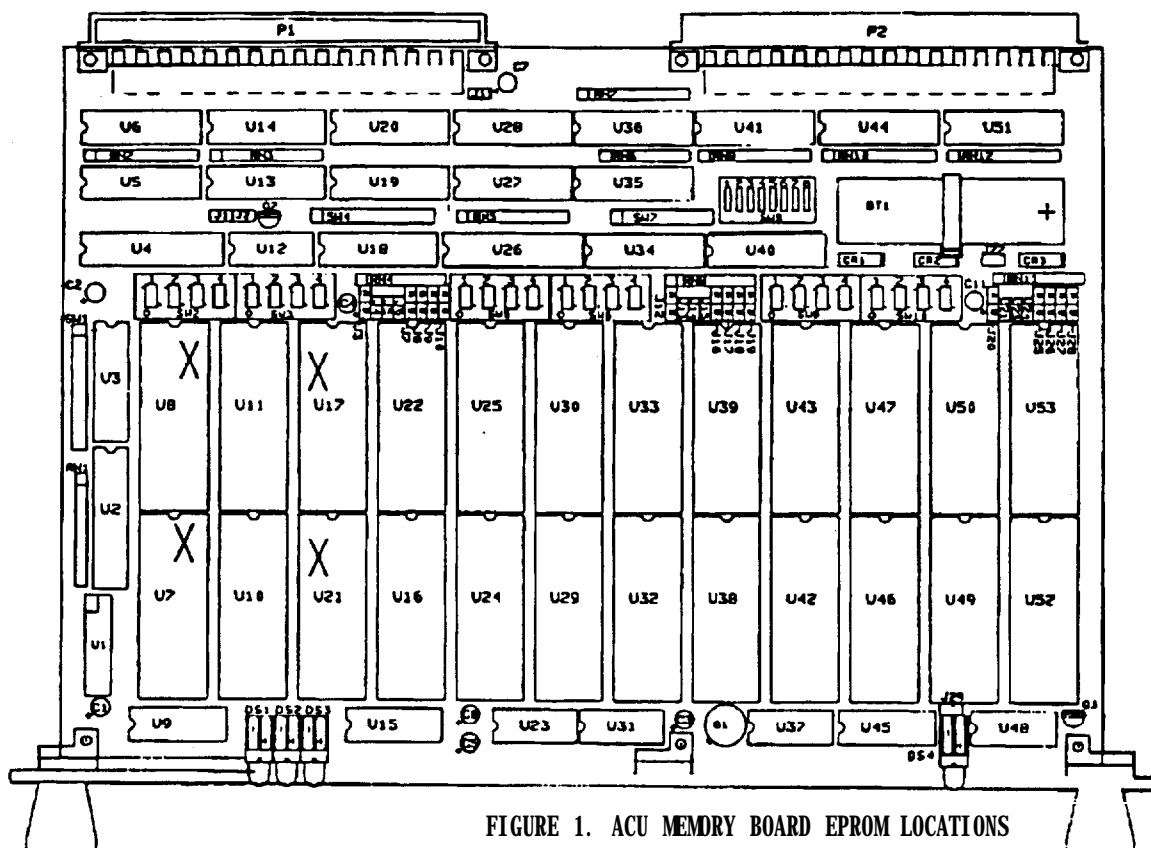


FIGURE 1. ACU MEMDRY BOARD EPROM LOCATIONS

EPROM DESIGNATOR	PART NUMBER	FUNCTION
U8	62828-45002-1	BYTE 0
U17	62828-45003-1	BYTE 1
U7	62828-45004-1	BYTE 2
U21	62828-45005-1	BYTE 3

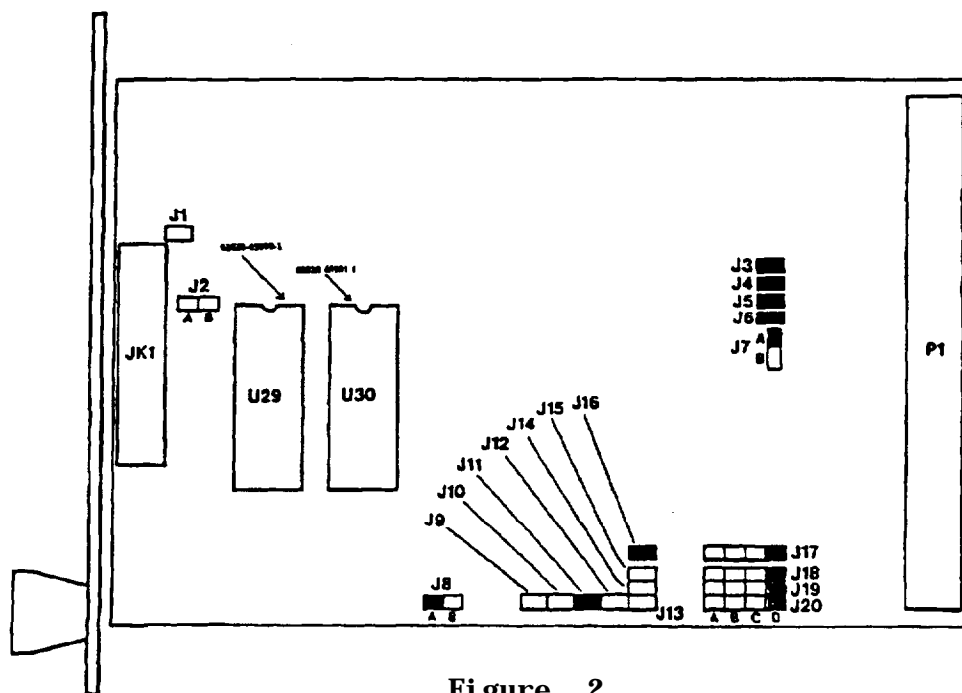


Figure 2

The test sites for version 2.2 were:

NWS Eastern Region	Akron, OH CAK Charleston, WV CRW Columbia, SC CAE Fitchburg, MA FIT Taunton, MA TAN
NWS Southern Region	Atlanta, GA ATL Memphis, TN MEM Orlando, FL MCO Tupelo, MS TUP
NWS Western Region	Missoula, MT MSO San Francisco, CA SFO
NWS Alaska Region	Anchorage, AK ANC

Operational Trouble Reports (OTR) Fixed in V2.2

TITLE/Summary

Version 2.2 of the ASOS ACU software incorporates revisions designed to improve the communications performance of sites using the FAA's GS-200 networks. Specifically, improved error recovery protocol has been added to handle line noise and other problems.

WS HQ USE ONLY		WS FORM A-26 (4/94) <small>Supersedes WS Form A-23 and WS Form H-28, which are obsolete</small>				U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE				Document Number G 49978		
ENGINEERING MANAGEMENT REPORTING SYSTEM MAINTENANCE RECORD												
General Information		1. Open Date 08 / 18 / 95		Time 0900		2. Initials MRB		3. Response Priority (check one) <input type="radio"/> Immediate <input type="radio"/> Low <input type="radio"/> Routine <input checked="" type="radio"/> Not Applicable		4. Close Date 08 / 18 / 95		Time 1000
5. Description ACU MODIFICATION I.A.W. MOD NOTE 20, ADD GS-200 COMMUNICATION ENHANCEMENTS												
Equipment Information		6. Station ID ABR		7. Equipment Code AACU		8. Serial Number 000334		9. TM M		10. AT M		11. How Mal. 999
12. EQUIPMENT OPERATIONAL STATUS TIMES		a. Fully Operational <div></div>		b. Logistics Delay <div></div>		Partly Operational		c. All Other <div></div>		d. Logistics Delay <div></div>		Not Operational e. All Other <div>01:00</div>
13. Parts Failure Information										14. Work Load Information		
Block #	a. ASN	b.	c. TM	d. AT	e. How Mal.	f. Qty.	g. Maint. Hrs.	Type	Staff Hrs.			
1								a. Routine				
2								b. Non-routine				
3								c. Travel				
4								d. Misc.	001:00			
5								e. Overtime				
Miscellaneous Information		15. Maintenance Comments INSTALLED ACU MEMORY FIRMWARE 2.2 AND CPU FIRMWARE 1.81									16. Initials MRB	
17. SPECIAL PURPOSE REPORTING		a. Mod. No. 20		b. Mod./Act./Deact. Date 08/18/95		c.		d.		e.		
18. CONFIGURATION MGMT. REPORTING (use as directed)		a. Block #		b. Manufacturer's Part No. of New Part						c. Revision No. of New Part		

APPENDIX E

07S	BGD	DNL	HDO	MCB
0A6	BIG	DRA	HEI	MCG
1S4	BIH	DRO	HI E	MCK
21A	BJJ	DSV	HKA	MCN
2B4	BKV	DTN	HKS	MEB
2B6	BLF	DTO	HLC	MEI
2V3	BLU	DVN	HOM	MFI
39J	BML	E02	HON	MGJ
3KM	BNO	EAA	HOT	MGW
3R5	BPI	ELD	HRO	MGY
3S2	BPK	ELN	HSI	MHK
3SM	BRD	ELY	HVR	MHS
3U6	BRW	ELZ	HWV	MI W
47C	BTM	EMP	I 14	MKL
5B5	BTT	ENN	I 15	MKO
5C0	BUY	EPH	I JD	MLC
6R0	BVO	EST	I MT	MLP
6V2	BWG	EWN	I NL	MLS
762	BYG	EYW	I NW	MLT
7MY	BZN	F54	I OW	MMV
813	C19	F90	I PL	MPV
8W5	CAG	FCA	I PT	MRH
9B9	CAO	FDR	I SN	MSL
A21	CDB	FFC	I SW	MTH
A8L	CDS	FFT	I XD	MTJ
ABR	CEU	FHR	JBR	MVL
ADG	CEZ	FI T	JEF	N00
AFN	CFV	FLD	JKL	N22
AHN	CGI	FOK	JST	N63
AI A	CKV	FST	KAL	
AKO	CLM	FVE	LAA	
ALS	CNK	GAG	LAW	
ALW	CNU	GCK	LBF	
AMG	CON	GED	LBT	
AMW	COT	GEY	LBX	
ANN	CQX	GGW	LEE	
APN	CRS	GI F	LFK	
ARA	CSM	GKN	LGU	
AST	CUB	GLD	LHX	
ASX	CXO	GLR	LOZ	
ATY	DAG	GMU	LVM	
AVX	DCU	GOK	LWC	
AXN	DDC	GRD	LWS	
B20	DFI	GSH	LWV	
BDE	DGW	GVL	M06	
BEH	DHT	GWO	M50	
BFD	DKK	HAO	M76	
BFF	DLN	HBG	MAE	
BFM	DMO	HBR	MA1	

N80	T31
N97	T39
NED	TAL
018	TAN
045	TCL
OFK	TCS
OFP	TDZ
OGB	THV
OLS	TKI
OME	T01
ONO	TOP
ORE	TPH
ORT	TQE
OTZ	TRL
OVE	TUP
PAH	U11
PAQ	U73
PASY	UNO
PBF	VEL
PDT	VPC
PGD	VPZ
PHD	VSF
PI R	VTN
PLN	W52
PNC	WLD
PPF	WMC
PTW	WVI
PUW	X41
PYM	
RBG	
RBL	
RHI	
RI L	
RKP	
RSL	
RZZ	
S22	
SDB	
SEG	
SGY	
SIT	
SMP	
SNY	
SOV	
SPW	
SSF	
SWD	
SWO	
SXT	
T02	
T27	

ASOS MODIFICATION NOTE 21 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM

SUBJECT : Firmware Upgrade for ASOS Light Emitting Diode Weather Indicator (LEDWI)

PURPOSE : Removal and replacement of U11 EPROM located on the Present Weather Sensor, Microprocessor Board S100-2MT2A1A1A3.

EQUIPMENT : ASOS Present Weather Sensor Microprocessor Board
AFFECTED

PARTS REQUIRED : EPROM Version 3.64

MODIFICATION : The above parts are available through NLSC. Technicians
PROCUREMENT should order S100-2MT2A1A1A3-U11, firmware, Rev. 3.64 LEDWI system. Review Appendix A for specific sites requiring the upgrade. ECP: E93SM05F090D

SPECIAL TOOLS : None
REQUIRED

TIME : 1 hour
REQUIRED

EFFECT ON OTHER: Supersedes Engineering Handbook 11, Volume 2, ASOS
INSTRUCTIONS Modification Note 5

VERIFICATION : This modification was successfully tested for
STATEMENT operational integrity at Sterling, VA, Johnstown, PA, and Silver Spring, MD. Operational field testing has been conducted at sites listed in Appendix B.

General:

Present weather sensors contain firmware versions 3.49 or 3.61. LEDWI firmware version 3.64 turns the hood heaters "ON" when the LEDWI detects "S+". The LEDWI heater voltage is increased from 24 VDC to 28 VDC. The resulting increased heater power will reduce the build up of ice under the top of the hoods and reduce ice build-up at the base of the transmitter and receiver windows.

BEFORE BEGINNING PROCEDURE

1. Call the AOMC at 1-800-242-8194. Inform the person who answers the phone that you will be completing modification note 21. Confirm that AOMC will provide access to the site-specific data base.
2. Get approval of the responsible MIC/OIC before starting deactivation. You may deactivate on any day of the month if permission is granted and the restrictions in steps 3 and 4 are complied with.
3. **Commissioned Sites Only:** Do not start deactivation during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of those conditions is expected within 3 hours. These meteorological conditions will be defined by the responsible MIC/OIC.
4. Do not start deactivation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Although about 45 minutes should be sufficient, allow 1 hour to complete deactivation and restart ASOS.
5. Immediately before beginning work at NWS staffed sites, the MIC/OIC/observer will inform the tower and any other critical users that the LEDWI will be shut off for deactivation (unstaffed sites, the el tech will inform tower). He/She will alert towers using Controller Video Displays (CVD) and Operator Interface Devices to log off and shut down display power to avoid confusion. At commissioned sites only, download the following data to your laptop using the direct command mode: 5-minute data (12 hrs.), SYSLOG information (24 hrs.), SHEF messages (24 hrs.), and any Z-hour archive files.
6. Do not begin the deactivation process, i.e., halt ASOS, until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.
7. Log on as TECH, turn off report processing for the LEDWI, stop here and perform the modification MOD 21.

Procedure:

Instructions for installing LEDWI Firmware 3.64

I Replace the LEDWI Firmware

1. At the DCP, turn the LEDWI circuit breakers to "OFF".
2. At the LEDWI, open the electronics enclosure door.
3. Remove the MPU card located in the card cage, 3rd slot from the top. Refer to Figure 1.

CAUTION SHOULD BE EXERCISED WHEN REMOVING AND REPLACING THE FIRMWARE!

4. Referring to the attached drawing LEDWI MPU card, carefully remove the EPROM located in the U11 position. Refer to Figure 3.

5. Install the 3.64 revision EPROM in the U11 position of the MPU card.
6. Reinstall the MPU card in 3rd slot of the card cage.

II Adjust the power supply

1. Locate FRU9 using Figure 1.
2. Connect a DVM to FRU9 using Figure 2 as a guide. The (+) lead of the DVM connects to the (+ OUT) bifurcated terminal and the (-) lead of the DVM connects to the (-OUT) bifurcated terminal.
3. At the DCP, turn the LEDWI circuit breakers to "ON."
4. Adjust heater power supply voltage. Using Figure 2, locate R11(V. Adj) on FRU9. Adjust R11 clockwise until the DVM reads 28 ± 0.02 VDC. Read the DVM and record the voltage here: _____VDC.
5. Heater power full load check and adjustment. Block the transmit beam for several minutes to turn on the hood heaters. After 2-3 minutes, determine if heaters are ON by feeling for heat.

CAUTION: USE EXTREME CARE AS THE HEATERS MAY BECOME HOT ENOUGH TO BURN SKIN. DO NOT TOUCH THE HOOD HEATERS DIRECTLY.

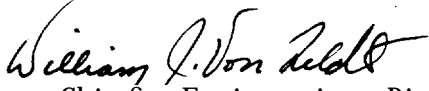
6. Read the DVM and record the full load voltage here: _____VDC.
7. Verify that the full load voltage is within $\pm 0.5V$ of the nominal voltage set in step above.
8. Remove the block from the transmit beam.
9. Disconnect the DVM from FRU9.
10. Press RESET button on the MPU card.
11. Close and secure the door of the electronics enclosure.

III. Validate the change

1. At the OID, verify that present weather data is being received on the 12-hour screen. The data will display 'M' for missing while the sensor was turned off.
2. Key the LEDWI maintenance screen and verify that the sensor is passing all self-tests. If 10 minutes has passed since the sensor was turned "ON," the data quality should be "P" for pass also.
3. Clear all errors after the sensor self-test and data quality report pass.
4. Enter (MAINT, ACTION, FMK) keys and the field mod kit number as MOD 21.
5. Check the SYSLOG/WRITE and verify the FMK message.
6. Exit the maintenance screen and bring up the SYSLOG/WRITE screen. Annotate the changes made to the LEDWI.
7. Turn on report processing for the LEDWI. Notify the AOMC via telephone that Mod 21 has been completed.

Reporting Modification

Target date for completion of this modification is 30 days after receipt of park. Report completed modification on WS Form A-26 maintenance record, per instructions in EHB-4, Part 2, Appendix F, using reporting code APWX. An example of a completed Form A-26 is provided.



Acting Chief, Engineering Division

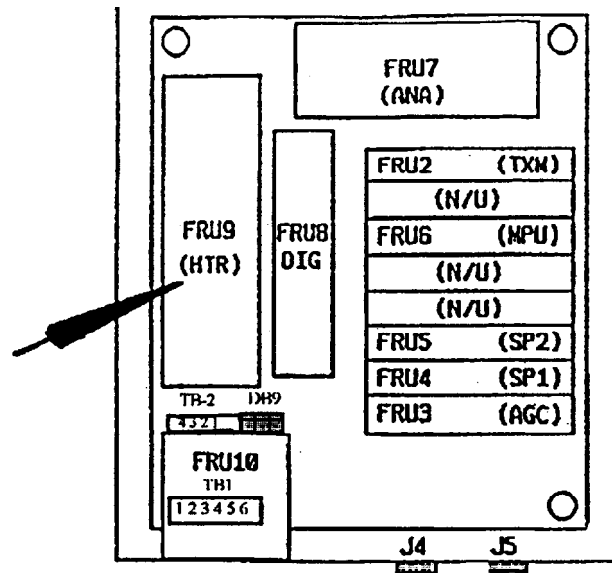


FIGURE-1 LOCATION OF FRUs IN LEDWI ELECTRONICS BOX

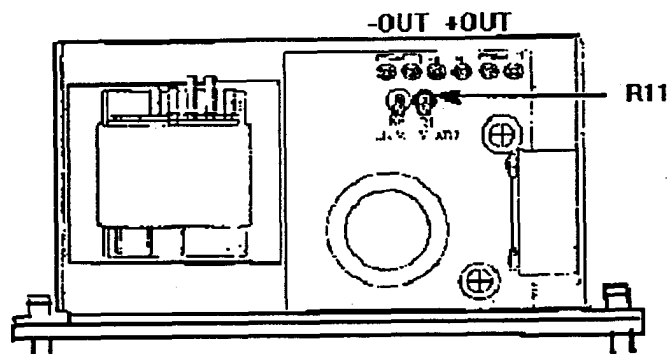


FIGURE 2

LOCATION OF ADJUSTMENT POT'S ON HEATER POWER SUPPLY FRU9

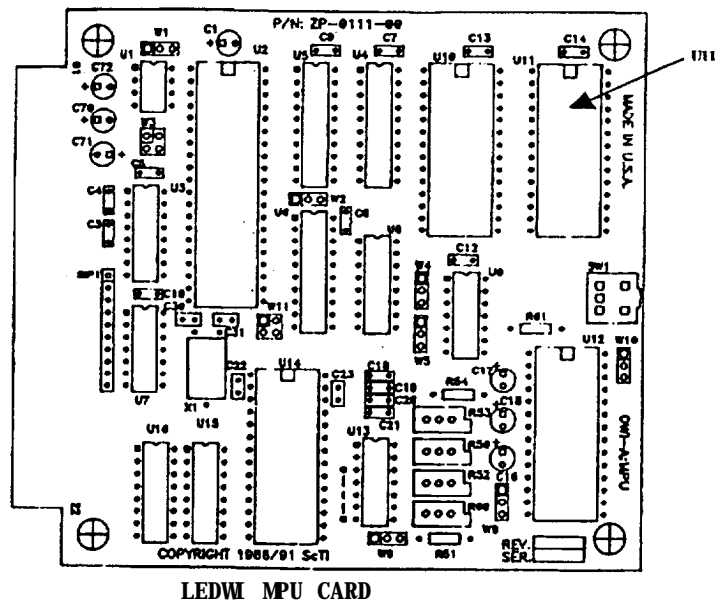


FIGURE- 3

Appendix A

The following list shows the SID's that require LEDWI firmware version 3.64:

07S	OA6	1S4	21A	22G
2B6	2V3	39J	3KM	3R5
3S2	3SM	3U6	47C	5B5
5CO	6RO	6V2	7G2	7MY
81J	9B9	A21	ABR	ACT
ACY	ADG	AW2	AFN	AGS
AIA	AKN	AK0	ALB	ALW
AMW	ANC	AOH	APN	ARA
ARB	ARR	AST	ATL	ATY
AVX	AXN	AZO	B20	BDE
BEH	BFD	BFF	BFM	BGD
BGM	BHM	BIH	BIL	BIS
BIX1	BIX2	BIX3	BJJ	BKV
BLF	BLU	BMG	BML	BPI
BPK	BRD	BRO	BTL	BTM
BTR	BTT	BUY	BVO	BWG
BYG	BZN	C19	CAE	CAG
CDB	CDS	CEU	CFV	CGI
CKB	CKV	CLE	CLM	CNK
CNU	COU	CPS	CQX	CRS
CRW	CSG	CSM	CXO	CYS
DAB	DCU	DEC	DET	DFI
DGW	DHN	DHT	DKK	DLN
DMO	DNL	DRO	DSM	DSV
DTN	DTO	DTW	DVN	E02
ELM	ELN	ELY	EMP	ENA
ENW	EPH	ERI	ESF	EST
EVV	EVW	EWB	EWN	F54
F90	FAI	FCA	FDR	FFC
FFT	FHR	FIT	FLD	FLG
FNT	FOE	FOK	FSD	FSM
FST	FVE	FWA	GAG	GCK
GCN	GED	GEG	GEY	GGW
GIF	GJT	GKN	GLR	GOK
GRB	GRI	GRR	GSH	GTF
GVL	GVW	GWO	HAO	HBG
HBR	HDO	HE1	HFD	HIE
HKA	HKS	HLG	HLN	HOM
HON	HOT	HRO	HSI	HSV
HTL	HUF	HUT	HVN	HVR
HMV	HYR	I14	I15	IJD
IMT	INW	IOW	ISW	ITO
IXD	JAN	JAX	JBR	JEF
JKL	JNU	JST	KNFJ	KNJW
KNLT	KNMM	KNVT	KOA	KTN
LAA	LAN	LAW	LBT	LEE

LEX	LFT	LGU	LHX	LIH
LIT	LNK	LOU	LOZ	LVM
LWC	LWS	LWV	MO6	M50
M76	MAE	MAI	MBS	MCB
MCG	MCI	MCK	MCN	MCO
MEB	MEM	MFD	MFI	MGJ
MGM	MGW	MGY	MHK	MIC
MIW	MKE	MKG	MKL	MKO
MLC	MLI	MLS	MLT	MLU
MMV	MNN	MOB	MPV	MRH
MSL	MSN	MS0	MTH	MTJ
MTO	MVL	MWH	N00	N22
N63	N80	N97	NED	NEXC
O18	O45	OFP	OGB	OGG
OJC	OLF	OLM	OMK	ONO
ORE	ORH	ORT	OSU	OVE
PADK	PAH	PAQ	PBF	PBI
PGD	PHBK	PHD	PHNA	PHNG
PHX	PIA	PIR	PKD	PLB
PLN	PNC	PPF	PSC	PTK
PTW	PUW	PWA	PWM	PYM
RAC	RBG	RFD	RHI	RIL
RKP	RSL	RVS	RZZ	S22
SAT	SAV	SBM	SBN	SEE
SCK	SEG	SFF	SGF	SIT
SLK	SLN	SMF	SMP	SMX
SNY	SOV	SPI	SPS	SPW
STC	STJ	STP	SUX	SWD
SWO	SXT	SYR	T02	T27
T31	TAL	TAN	TCL	TDZ
THV	TLH	TMB	TO1	TOR
TQE	TRL	TUP	TUS	U11
U73	UCA	UN0	VEL	VPZ
VSF	W52	WLD	WVI	X41
YKM	YNG			

EHB-11
 Issuance 95-11
 8/8/95

Appendix B

The following list shows the SID's that operationally tested LEDWI firmware version 3.64:

Eastern Region

BML, BGM, CRW, AFN, 2B6, ORE, PWM, SYR, HIE, IPT, ILG

Southern Region

AMA, FSM, OKC, ACT, SPS

Central Region

AKO, ALS, COS, CNK, DVX, DDC, DBQ, GLD, GRI, LNK, SDF, MCW, MTJ, PUB, RST, SNY, SUX, TOP, ICT

Western Region

AST, ELY, BLU, FLG, GGW, GCN, GTF, HVR, FCA, MSO, SEA, SXT, SMP, WMC

Alaska Region

CDB, OTZ, OME

WS HQ USE ONLY		WS FORM A-26-(4/94) <small>Supersedes WS Form A-23 and WS Form H-28, which are obsolete</small>				U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE				Document Number			
ENGINEERING MANAGEMENT REPORTING SYSTEM MAINTENANCE RECORD													
General Information		1. Open Date 10 / 11 / 94		Time 0900		2. Initials MRB		3. Response Priority (check one) <input type="radio"/> Immediate <input type="radio"/> Low <input type="radio"/> Routine <input checked="" type="radio"/> Not Applicable		4. Close Date Time 10 / 11 / 94 1100			
5. Description LEDWI MODIFIED I. A. W MDD NOTE #21													
Equipment Information		6. Station ID LHX		7. Equipment Code ASOS		8. Serial Number 0041		9. TM M		10. AT M		11. How Mal. 999	
12. EQUIPMENT OPERATIONAL STATUS TIMES		a. Fully Operational <div></div>		b. Logistics Delay <div></div>		Partly Operational		c. All Other <div></div>		d. Logistics Delay <div></div>		Not Operational e. All Other <div>02:00</div>	
13. Parts Failure Information										14. Work Load Information			
Block #	a. ASN	b. NSN	c. TM	d. AT	e. How Mal.	f. Qty.	g. Maint. Hrs.	Type	Staff Hrs.				
1	S100-2MT2A1A1A3	5998-01-368-4596	M	R	999	1	1:00	a. Routine					
2								b. Non-routine					
3								c. Travel					
4								d. Misc.	1:00				
5								e. Overtime					
Miscellaneous Information		15. Maintenance Comments LEDWI FIRMWARE UPGRADE TO VER 3.64.									16. Initials MRB		
17. SPECIAL PURPOSE REPORTING		a. Mod. No. 21		b. Mod./Act./Deact. Date 10/11/94		c.		d.		e.			
18. CONFIGURATION MGMT. REPORTING (use as directed)		a. Block # 1		b. Manufacturer's Part No. of New Part S100-2MT2A1A1A3						c. Revision No. of New Part 3.64			

Additional Information to Modification Note 21 dated August 8, 1995

General

Errata sheet number 1 provides instructions to correct EHB-11, section 3.6, page 3 of modification note 21. The reason for the change is to provide additional information after modification note 21 was published.

Effects on Other Instructions

Page 3 of modification note 21, Volume 2, EHB-11, section 2.6.

Procedures:

Add the following information:

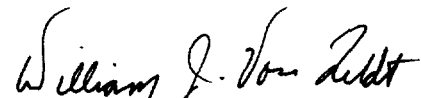
1. Step 4 Section II Adjust the power supply.

CHANGE : Pen-and-ink change. Add the following after the third sentence:

If R11 has been adjusted fully clockwise and the voltage is not within tolerance, the minimum acceptable voltage is 27.0 volts DC.

Add the following after the last sentence:

If the voltage is below 27.0 VDC, replace the heater power supply.


Acting Chief, Engineering Division

ASOS MODIFICATION NOTE 22 (for Electronics Technicians)

Engineering Division

W/OS0321: RWC

SUBJECT : Wind Sensor Assembly Upgrade, Firmware Version 3.0

PURPOSE : To add operational enhancements for the ASOS wind sensors

EQUIPMENT AFFECTED : ASOS

PARTS REQUIRED : EPROM, ASN S100-2A8MT1A1A2-U7, P/N 27C512 Rev. 3.0, qty. 1

MODIFICATION PROCUREMENT : Technicians will be issued the parts listed above for each ASOS site identified in the attachment (A-2). Additionally, each technician will be issued an EPROM for the spares kit.

SPECIAL TOOLS REQUIRED : None

TIME REQUIRED : 2 hours

EFFECT ON OTHER INSTRUCTIONS : ASOS Modification Note 8 is superseded.

CERTIFICATION STATEMENT : This modification is authorized by Engineering Change Proposal E94SM05F121. It was successfully tested at eight sites in the Southern and Central Regions and at the Test and Evaluation Branch in-sterling, Virginia.

BIS SLE
CYS SAT
MSO BFF
PDT ORH

GENERAL

This note provides procedures and instructions for upgrading the ASOS wind system. System upgrading is accomplished by first removing the processor board from the wind system electronics enclosure and replacing EPROM U7 (Revision 3.0 wind firmware). This firmware upgrade changes the wind gust averaging algorithm.

EHB-11
Issuance 94-21
12-30-94

PROCEDURE

Before and After Installation Procedures

Procedures Related to Installation of Wind Firmware Version 3.0

BEFORE INSTALLING FIRMWARE

1. Obtain approval of the site-MIC/OIC-before starting-installation. You may install on any day of the month if permission is granted and the restrictions in step 3 are complied with.
2. Call the AOMC at 1-800-242-8194. Inform the AOMC at which site you will be installing this modification.
3. **Commissioned Sites Only:** Do not start installation during bad weather: while precipitation is falling, during instrument flight rule (IFR) conditions, or if either is expected within 3 hours.

AFTER INSTALLING FIRMWARE

4. **IF MANUAL BACKUP IS AVAILABLE,** office staff will implement manual full backup observation procedures if installation runs past the regular hourly observation time or if a special observation must be generated. No special observation is needed when the wind system is restarted.
5. Inform office staff that ASOS is again operational.
6. Verify that ASOS transmitted an hourly observation. Call the AOMC and tell them:
 - a. Your location,
 - b. that installation of the modification has been completed, and,
 - c. that ASOS is operational.

WIND SENSOR UPGRADE

1. At the DCP, turn the wind circuit breaker to off.
2. Remove hardware mounting the PCB p/n 82205 in the enclosure, then remove the PCB from the connector.
3. Locate U7 (p/n 31977 Rev. 2.07 or earlier) on the PCB and remove from the socket; (Use the PCB figure on page A-1.)
4. Install new EPROM (Rev. 3.0) in socket, observing proper pin 1 orientation.
5. Make sure EPROM legs, do not get bent during installation into socket.

6. Reinstall the PCB into the connector in the enclosure, making sure it is fully seated in position.
7. Restore power to wind system and check for proper operation.

(These procedures can be found in the ASOS Site Technical Manual paragraph 4.5.15.

SHIPPING INSTRUCTIONS

After the modification has been accomplished, package the EPROMs for shipment to NRC attention Roger Helphrey, ASOS depot repair. Items being returned should include the S100-2A8MT1A1A2-U7 (Rev. 2.07 EPROM).

REPORTING MODIFICATION

For commissioned sites, the target date for completion of this modification is 7 days after receipt of parts. For other sites, the target date for completion is 14 days after receipt of parts. Report completed modification on WS Form A-26, Maintenance Record, following instructions in EHB-4, part 2, using reporting code AWIND. In addition to the instructions provided in EHB-4, Appendix F., the following special guidance applies:

1. Report this modification using the EMRS Electronic Data Entry System.
2. Those sites whose Regional EMRS accounts have not been activated shall report this modification using the EMRS Electronic Data Entry System Demo account.
 - a) Direct Dial Phone Number: 301-713-1924
 - b) USER NAME: EMUSER
 - c) PASSWORD: Repair
3. Record the firmware revision number in block 18.e. (do not record the serial number of the new part).
4. As per the instructions in EHB-4, Appendix F., ensure that the required information is provided on the electronic A-26. (example A-26 provided as attachment A-3).

Make appropriate entries in the SYSLOG using the Maintenance Action keys, modification keys and comment fields. Follow the steps in the example below.

1. Log on as TECH.
2. Key the MAINT screen.
3. Key the ACTION page.
4. Key START - Stop here and perform the modification procedure
After the task is complete, log on the system.
5. Key the MAINT screen,
6. Key the ACTION page.
7. Key FMK - the OID will display the "Field Modification Kit Maintenance Data" page.
8. Enter the Field Modification Kit Number, MOD 22. Complete by entering Y in the Y/N if the information in the previous two lines is correct.

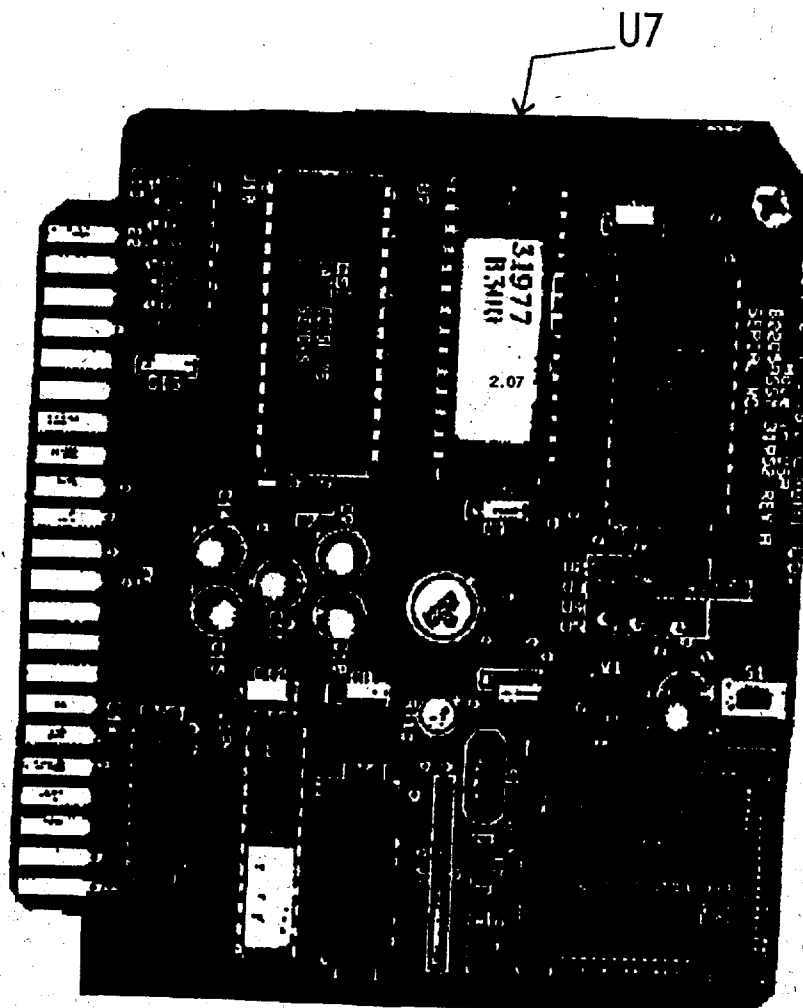
EHB-11
Issuance- 94-21
12-30-94

9. Check the SYSLOG and verify the FMK message. Notify the AOMC as described in Step 6 of the After Installation Procedure.

A handwritten signature in black ink, appearing to read "J. Michael St. Clair".

J. Michael St. Clair
Chief, Engineering Division

Attachments



**WIND PROCESSOR
BOARD**

LISTING OF SIDs REQUIRING WIND SENSOR MODIFICATION NOTE 19

07S	0A6	1S4	21A	226	2B6	2V3	39J	3KM	3R5
3S2	3SM	3U6	47C	5B5	5C0	6R0	6V2	7G2	7MY
81J	9B9	A21	ABR	ACT	ACY	ADG	ADQ	AFN	AGS
AI A	AKN	AKO	AL5	ALS	ALW	AMA	AMW	ANC	AOH
APN	ARA	ARB	ARR	AST	ATL	ATY	AVX	AXN	AZO
B20	BDE	BEH	BFD	BFF	BFM	BGD	BGM	BHM	BIL
BIS	BI X1	BI X2	BI X3	BJJ	BKV	BLF	BLU	BMG	BML
BPI	BPK	BRD	BRO	BTL	BTM	BTR	BTT	BUY	BVO
BWG	BYG	BZN	C19	CAE	CAG	CDB	CDS	CEU	CFV
CGI	CKB	CKV	CLE	CLM	CNK	CNU	COS	COU	CPS
CQX	CRS	CRW	CSG	CSM	CXO	CYS	DAB	DCU	DDC
DEC	DET	DFI	DGW	DHN	DHT	DKK	DLN	DMO	DNL
DRO	DSM	DSV	DTN	DTO	DTW	DVN	DVX	E02	ELM
ELN	ELY	EMP	ENA	ENW	EPH	ERI	ESF	EST	EVV
EVW	EWB	EWN	F54	F90	FAI	FCA	FDR	FFC	FFT
FHR	FIT	FLD	FNT	FOE	FOK	FSD	FST	FVE	FWA
GAG	GCK	GCN	GEG	GEY	GIF	GKN	GLD	GLR	GOK
GRB	GRI	GRR	GSH	GTF	GVL	GWO	HAO	HBG	HBR
HDO	HEI	HFD	HIE	HKA	HKS	HLG	HLN	HOM	HON
HOT	HRO	HSI	HSV	HTL	HUF	HUT	HVN	HVR	HWV
HYR	I14	I15	ICT	IJD	IMT	IOW	IPT	ISW	ITO
IXD	JAN	JAX	JBR	JEF	JKL	KNFJ	KNJW	KNMM	KOA
KOLA	KOLW	KTN	LAA	LAN	LAW	LBT	LEE	LEX	LGU
LHX	LIH	LIT	LNK	LOU	LOZ	LVM	LWC	LWS	LWV
MO6	M50	M76	MAE	MAI	MBS	MCB	MCG	MCI	MCK
MCN	MCO	MEB	MEM	MFD	MFI	MGM	MGW	MGY	MHK
MIC	MIW	MKE	MKG	MKL	MKO	MLC	MLI	MLS	MLT
MLU	MMV	MNN	MPV	MRH	MRI	MSL	MSN	MSO	MTH
MTJ	MT0	MVL	MWH	NOO	N22	N63	N80	N97	NED
NEXC	018	045	0FP	0GB	0GG	0JC	OKC	OLF	OLM
OMK	ONO	ORE	ORH	ORT	OVE	PADK	PAH	PAQ	PBF
PBI	PDT	PGD	PHBK	PHD	PHNA	PHX	PIA	PIR	PKD
PLB	PLN	PNC	PPF	PSC	PTK	PTW	PUB	PUW	PWA
PWM	PYM	RAC	RBG	RFD	RHI	RIL	RKP	RSL	RVS
RZZ	S22	SAV	SBM	SBN	SCC	SCK	SDF	SEG	SFF
SGF	SIT	SLK	SLN	SMF	SMP	SMX	SNY	SOV	SPI
SPS	SPW	STC	STJ	STP	SUX	SWD	SWO	SXT	SYR
T02	T27	T31	T39	TAL	TAN	TCL	TDZ	THV	TLH
TM5	TOI	TOP	TOR	TQE	TRL	TUL	TUP	U11	U73
UCA	UNO	VEL	VPZ	VSF	W52	WLD	WVI	X41	YKM
YNG	ALO	ASX	BIH	BPT	CLL	CMF	COT	CRP	DBQ
DRA	HKS	IAH	INL	INW	KNQI	KNUQ	KNYL	LBX	MRY
OMA	RBL	RDD	RNO	RST	SAT	SEL	TPH	VTN	

WS HQ USE ONLY		WS FORM A-26 (4/94) <small>Supersedes WS Form A-25 and WS Form H-24, which are obsolete</small>			U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE			Document Number	
ENGINEERING MANAGEMENT REPORTING SYSTEM MAINTENANCE RECORD									
General Information		1. Open Date 10 / 17 / 94	Time 1200	2. Initials RWC	3. Response Priority (check one) <input type="radio"/> Immediate <input type="radio"/> Low <input type="radio"/> Routine <input checked="" type="radio"/> Not Applicable			4. Close Date 10 / 17 / 94	Time 1330
5. Description WIND SENSOR MODIFIED I. A. W. MOD NOTE #22									
Equipment Information		6. Station ID PBI	7. Equipment Code AWIND	8. Serial Number 04321		9. TM M	10. AT M	11. How Mal. 999	
12. EQUIPMENT OPERATIONAL STATUS TIMES		a. Fully Operational <div></div>	b. Logistics Delay <div></div>	Partly Operational		c. All Other <div></div>	d. Logistics Delay <div></div>	Not Operational e. All Other 1:30	
13. Parts Failure Information								14. Work Load Information	
Block #	a. ASN	b. NSN	c. TM	d. AT	e. How Mal.	f. Qty.	g. Maint. Hrs.	Type	Staff Hrs.
1	S100-2A8MT1A1A2-U7	5962-AS-200-0098-X	M	R	999	1	1:30	a. Routine	
2								b. Non-routine	
3								c. Travel	
4								d. Misc.	001:30
5								e. Overtime	
Miscellaneous Information		15. Maintenance Comments							16. Initials RWC
17. SPECIAL PURPOSE REPORTING		a. Mod. No. 22	b. Mod./Act./Deact. Date 10/17/94	c.	d.	e.			
18. CONFIGURATION MGMT. REPORTING (use as directed)		a. Block # 1	b. Manufacturer's Part No. of New Part S100-2A8MT1A1A2-U7				c. Revision No. of New Part 3.0		

SUBJECT : Snow Radiation Shield

PURPOSE : Eliminate a ceilometer general alarm when there is snow cover and bright sunlight.

EQUIPMENT AFFECTED : ASOS Laser Beam Ceilometer

PARTS REQUIRED : 1 ea., snow radiation shield P/N 50-20663
1 ea., Label CT12K P/N 98-20678

MOD PROCUREMENT : The above parts will be provided through NLSC as an ASOS Field Modification Kit S100-2MT1MP2. Technicians are to order for each site (listed in Appendix B) in their assigned maintenance area(s).

SPECIAL TOOLS REQUIRED : Allen wrench, 3/16 inches

TIME REQUIRED : 1 hour

EFFECT ON OTHER INSTRUCTIONS : None

AUTHORIZATION : This modification is authorized by ECP E94SM05F122

VERIFICATION STATEMENT : This modification has been successfully tested for operational integrity at Sterling, Virginia, and the sites listed in Appendix A

GENERAL

This modification adds a snow radiation shield to the Laser Beam Ceilometer (LBC). It is attached to the ceilometer by a flange that fits between the top of the pedestal and the LBC. The radiation shield fits over the ambient air temperature sensor on the bottom side of the equipment housing. The shield protects the ambient air temperature sensor from being heated from snow reflected sunlight. The shield must remain in place year-round.

PROCEDURE

BEFORE INSTALLING SNOW SHIELD

1. Call the AOMC at 1-800-242-8194. Inform the AOMC at which site you will be installing the snow radiation shield. Confirm that the AOMC will provide access to the site-specific data base.
2. For commissioned sites, obtain approval of the responsible MIC/OIC before starting installation. For non-commissioned sites, coordinate with the MIC/OIC before starting installation. You may install on any day of the month if permission is granted and the restrictions in step 3 are complied with.
3. **Commissioned Sites Only:** Do not start installation during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any one of those conditions are expected within 3 hours. These meteorological conditions will be defined by the responsible MIC/OIC.

INSTRUCTIONS

4. The snow radiation shield is held in place by a flange on the edge of the shield. It is installed underneath the ceilometer with one surface parallel to the edge of the ceilometer base and the flange against the pedestal top plate. The flange fits between the top of the pedestal and the bottom of the ceilometer. It is mounted at the opposite end from the fan cable and connector. It is mounted midway between the sides and over top of the ambient air sensor housing which protrudes out of the bottom of the ceilometer. Reference figure 1 for a pictorial view.
5. Find the end of ceilometer opposite the fan cable entry on the bottom of the ceilometer. Remove the two screws that secure the ceilometer to the pedestal on that end of the ceilometer.
6. On the end of the ceilometer where the fan cable enters the ceilometer base, loosen, but do not remove, the two screws that secure this end to the pedestal. Loosen so about 1/16 inch is between the head of the screw and the pedestal.
7. Ensure that the thumb screws securing the blower assembly, and the two latches securing the ceilometer cover to the base plate, are in place and tight.

8. Find the end of the ceilometer where the temperature sensor housing is located. This is the same end from which the two screws were removed. The ceilometer will be tilted away from this end.
9. In one hand, hold the snow radiation shield so the flange is toward the pedestal. With the other hand, lift at the side of the ceilometer. If your lifting hand is at the end of the ceilometer, it will be in the way when the shield is put in the ceilometer to aid in lifting and pushing. Carefully tilt the ceilometer away from you.
10. Insert the shield between the inside edge of the ceilometer and the pedestal top assembly so the flange fits over top of the pedestal. Lower the ceilometer to secure the snow radiation shield. Reference figure 1.
11. Check that the shield is positioned midway with respect to the sides of the ceilometer. Move as necessary by sliding.
12. Reinstall the two screws removed in step 5.
13. Tighten all four mounting screws (step 5 and step 6) that secure the ceilometer to the pedestal.
14. Apply the stick-on part number above the existing name plate on the side of the ceilometer.

AFTER INSTALLING SNOW RADIATION SHIELD

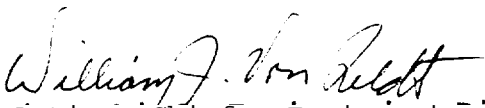
15. Inform site office staff that the ASOS is again operational. Call the AOMC and tell them:
 - a. Your location,
 - b. Installation of the modification has been completed, and the ASOS is operational.

REPORTING MODIFICATION

Target date for completion of this modification is 30 days after receipt of parts. Electronically report the completed modification on WS Form A-26, Maintenance Report, for each system using instructions in EHB-4, Part 2, Appendix F. Use reporting code ASKY. An example of the Form A-26 is provided.

Make appropriate entries in the SYSLOG using the Maintenance Action keys, Field Modification keys, and comment fields. Follow these steps:

- a. Log on as TECH.
- b. Key the MAINT screen.
- c. Key the ACTION page.
- d. Key START - Stop here and perform the modification.
After Mod Note 24 activities are completed, log
onto the system.
- e. Key the MAINT screen.
- f. Key the ACTION page.
- g. Key FMK - Enter the Field Mod Kit (FMK) number as
follows: MOD 24.
On the second line of the screen verify that only
MOD 24 is displayed.
Complete by entering Y in the Y/N if only MOD 24 is
displayed.
- h. Check the SYSLOG and verify the FMK message.

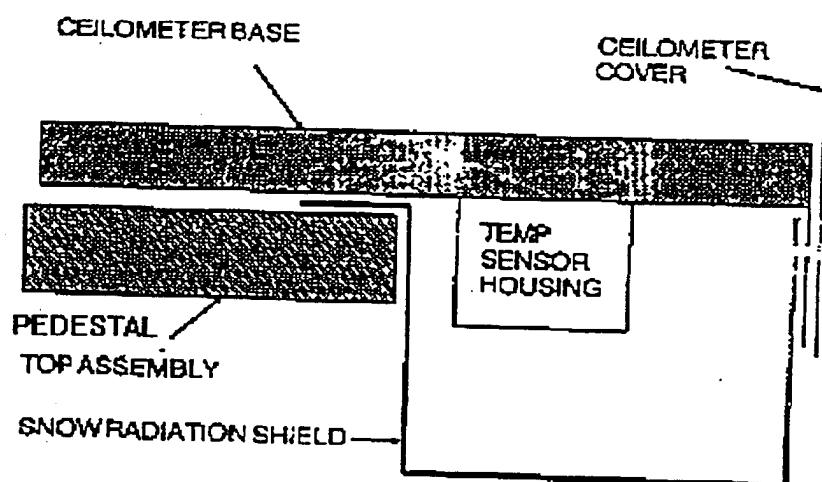


Acting Chief, Engineering Division

Attachments

Appendix A

Appendix B



**CROSS SECTION OF SNOW RADIATION SHIELD
INSTALLED ON A CEILOMETER**

Figure 1

EHB-11
Issuance 95-12
9/01/95

Sites for the snow shield demonstration

EASTERN

PORTLAND, ME - PWM
SYRACUSE, NY - SYR
CHARLESTON, WV - CRW
ALBANY, NY - ALB
BERLIN, NH - BML
WHITEFIELD, NH - HIE
WORCESTER, MA - ORH
ERIE, PA - ERI
NORTH ADAMS, MA - 2B6
WISCASSET, ME - 9B9
JAFFREY, NH - AFN
CLEVELAND, OH - CLE

WESTERN

STAMPEDE PASS, WA - SMP
SEXTON SUMMIT, OR - SXT
BLUE CANYON, CA - BLU
KALLISPELL, MT - FCA
HAVRE, MT - HVR
GLASGOW, MT - GGW
GREAT FALLS, MT - GTF
HELENA, MT - HLN
ELY, NV - ELY
MISSOULA, MT - MSO
SPOKANE, WA - GEG
PENDLETON, OR - PDT
YAKIMA, WA - YKM

CENTRAL

ABERDEEN, SD - ABR
ALAMOSA, CO - ALS
GRAND ISLAND, NE - GRI
LINCOLN, NE - LNK
GOODLAND, KS - GLD
CONCORDIA, KS - CNK
TOPEKA, KS - TOP
WICHITA, KS - ICT
KANSAS CITY, MO - MCI
HASTINGS, NE - HSI
TEKAMAH, NE - TQE
IOWA CITY, IA - IOW
PADUCAH, KY - PAH
ALPENA, MI - APN
ST CLOUD, MN - STC
DUBUQUE, IA - DBQ
SIDNEY, NE - SNY
ROCKFORD, IL - RFD
PEORIA, IL - PIA
SPRINGFIELD, IL - SPI
FORT WAYNE, IN - FWA
MADISON, WI - MSN
ROCHESTER, MN - RST
SOUTH BEND, IN - SBN
WATERLOO, IA - AL0

07S	BFD	DAG	GCK	JEF
1S4	BFF	DAY	GCN	JKL
22G	BGD	DBQ	GED	JNU
2B4	BGM	DCA	GEG	JST
2B6	BIG	DDC	GEY	KAL
2V3	BIH	DEC	GGW	KNXX
3KM	BIL	DEN	GJT	KNYG
3S2	BIS	DET	GKN	KTN
3SM	BIX1	DFI	GLD	LAA
3SZ	BIX2	DGW	GLR	LAN
3U6	BIX3	DHT	GRB	LAS
47C	BJJ	DKK	GRI	LBF
5B5	BLF	DLN	GRR	LEX
5CO	BLU	DMO	GSH	LGU
6V2	BMG	DRA	GTF	LHX
7G2	BML	DRO	GVW	LNK
7MY	BNO	DSM	HAO	LOU
9B9	BOI	DSV	HE1	LOZ
A21	BPI	DTW	HFD	LVM
A8L	BRD	DVN	HIE	LWC
ABE	BRW	EAA	HLC	LWS
ABQ	BTL	ELM	HLN	LWV
ABR	BTM	ELN	HOM	MBS
ADG	BTT	ELY	HON	MCG
ADQ	BYG	ELZ	HRO	MCI
AFN	BZN	EMP	HSI	MCK
AIA	C19	ENA	HTL	MDH
AKN	CAG	ENN	HUF	MFD
AKO	CAK	ENW	HUT	MFI
ALB	CAO	EPH	HVN	MFR
AL0	CDB	ERI	HVR	MGJ
ALS	CEZ	EST	HWV	MGW
ALW	CFV	EVV	HYR	MGY
AMA	CGI	EVW	I14	
AMW	CKB	EWB	I15	
ANC	CLE	FAI	IAD	
ANN	CMI	FAR	ICT	
AOH	CNK	FCA	IGM	
APN	CNU	FFT	IJD	
ARB	CON	FIT	ILG	
ARR	COS	FLD	IMT	
ASX	COU	FLG	INL	
ATY	CPR	FNT	INW	
AXN	CPS	FOE	IOW	
AZO	CQX	FSD	IPT	
B20	CRW	FVE	ISN	
BDE	CVG	FWA	ISW	
BEH	CYS	GAG	IXD	

MHK	PLN	TCS
MHS	PNE	TDZ
MIC	PPF	THV
MIW	PSC	TOP
MKE	PSP	TOR
MKG	PTK	TPH
MLI	PTW	TQE
MLP	PUB	TRI
MLS	PUW	TYS
MLT	PVD	U11
MNN	PWK	U73
MPV	PWM	UCA
MRI	PYM	UNO
MSN	RAC	VEL
MSO	RAP	VPZ
MTJ	RBG	VSF
MTO	RFD	VTN
MVL	RHI	WLD
MWH	RIL	WMC
N00	RIW	YIP
N22	RNO	YKM
N63	ROW	YNG
N97	RSL	
NED	RST	
NYC	S22	
OFK	SBM	
OJC	SBN	
OLF	SCC	
OLM	SDF	
OMA	SEG	
OME	SFF	
OMK	SGF	
ONO	SGY	
ORE	SIT	
ORH	SLK	
ORT	SLN	
OSH	SMP	
OSH	SNY	
OTZ	SOV	
OVE	SPI	
PADK	SPW	
PAQ	STC	
PASY	STJ	
PDT	STL	
PDX	STP	
PGA	SUX	
PHD	SWD	
PHL	SXT	
PIA	SYR	
PIR	TAL	
PKD	TAN	

WS HQ USE ONLY		WS FORM A-26 (4/94) <small>Supersedes WS Form A-23 and WS Form H-28, which are obsolete</small>				U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE		Document Number G 49978							
ENGINEERING MANAGEMENT REPORTING SYSTEM MAINTENANCE RECORD															
General Information		1. Open Date 07 / 24 / 95		Time 0900		2. Initials MRB		3. Response Priority (check one) <input type="radio"/> Immediate <input type="radio"/> Low <input type="radio"/> Routine <input checked="" type="radio"/> Not Applicable		4. Close Date 07 / 24 / 95		Time 1000			
5. Description CEILOMETER MODIFICATION I.A.W. MOD NOTE 24															
Equipment Information		6. Station ID PWM		7. Equipment Code ASKY		8. Serial Number S0125		9. TM M		10. AT M		11. How Mal. 999			
12. EQUIPMENT OPERATIONAL STATUS TIMES		a. Fully Operational <div style="border: 1px solid black; height: 20px; width: 80px;"></div>		b. Logistics Delay <div style="border: 1px solid black; height: 20px; width: 80px;"></div>		Partly Operational		c. All Other <div style="border: 1px solid black; height: 20px; width: 80px;"></div>		d. Logistics Delay <div style="border: 1px solid black; height: 20px; width: 80px;"></div>		Not Operational		e. All Other <div style="border: 1px solid black; height: 20px; width: 80px; text-align: center;">01:00</div>	
13. Parts Failure Information												14. Work Load Information			
Block #	a. ASN	b. S/N	c. TM	d. AT	e. How Mal.	f. Qty.	g. Maint. Hrs.	Type	Staff Hrs.						
1								a. Routine							
2								b. Non-routine							
3								c. Travel							
4								d. Misc.	001:00						
5								e. Overtime							
15. Miscellaneous Information		15. Maintenance Comments ADDITION OF SNOW RADIATION SHIELD TO CEILOMETER								16. Initials MRB					
17. SPECIAL PURPOSE REPORTING		a. Mod. No. 24		b. Mod./Act./Deact. Date 07/24/95		c.		d.		e.					
18. CONFIGURATION MGMT. REPORTING (use as directed)		a. Block #		b. Manufacturer's Part No. of New Part						c. Revision No. of New Part					

SUBJECT : Reactivation of ASOS Hygrothermometer
Autobalance Module.

PURPOSE : This modification reactivates the
autobalance module in the ASOS
Hygrothermometers. The Autobalance
module was deactivated by Modification
Note 16 (ECP S00549).

EQUIPMENT AFFECTED : ASOS Hygrothermometer

PARTS REQUIRED : None

MODIFICATION : None
PROCUREMENT

SPECIAL TOOLS : None
REQUIRED

TIME REQUIRED : 1 hour

EFFECT ON OTHER : ASOS Modification Note 16 and
INSTRUCTIONS Maintenance Note 15 are obsolete.

AUTHORIZATION : This modification is authorized by the
Engineering Design Branch, W/OSO31

VERIFICATION : Returns the system to its original
STATEMENT operational configuration which has been
tested successfully.

GENERAL

It was discovered during environmental testing at T&EB that some 1063/1088 hygrothermometers may experience the autobalance servo potentiometer being driven to extremely high values during the

daily sensor heat cycle under certain temperature extremes. This will cause the dirty mirror error flag to be set in the temperature/dew-point data message for the 1088 and thicker than normal dew layers on the 1063 and the 1088 hygrothermometers. A thicker dew has caused problems with frozen mirrors under certain conditions.

On the 1088 this problem can occur at ambient temperatures above 95°F and temperatures below 10°F. On the 1063 this problem will only occur in temperatures below 10°F. The problems will not occur on 100 percent of the hygrothermometers, but are dependent on the component tolerances in the individual hygrothermometers.

The interim solution was to disconnect the autobalance on all ASOS hygrothermometers (ECP S00549). However, this reduced the mirror cleaning interval from 90 to 45 days. Due to the additional work load, the autobalance module on all 1063/1088 hygrothermometers will be reconnected, and a 90-day maintenance cycle reestablished.

The contractor is developing sensor firmware to correct the problem at the temperature extremes. At least three seasons of testing, including one winter, will be required to validate the fix before it can be approved for use in ASOS.

BEFORE BEGINNING PROCEDURE

1. Get approval of the responsible MIC/OIC before starting deactivation. You may complete the modification *on* any day of the month if permission is granted, and the restrictions in steps 3 and 4 are complied with.
2. **Commissioned Sites Only:** Do not start during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of those conditions is expected within 3 hours. These meteorological conditions will be defined by the responsible MIC/OIC.
3. Do not start at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Although 10 minutes should be sufficient, allow 0.5 hour to complete.

4. Immediately before beginning work at NWS-staffed sites, the MIC/OIC/observer will inform the tower and any other critical users that the hygrothermometer will be shut off (unstaffed sites, the el tech will inform tower).
5. Do not begin until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.
6. Call the AOMC at 1-800-242-8194. Inform the person who answers the phone at which office you will be completing Modification Note 27.
7. Log on as TECH, turn off report processing for the Hygrothermometer, stop here and perform the modification MOD 27.
 1. Log on as **TECH**.
 2. Key the **MAINT** screen,
 3. Key the **ACTION** page.
 4. Press the **Start** key,
 5. Exit, log off as **TECH**. Complete the modification.

PROCEDURE

1. Follow normal procedures for ASOS maintenance and powering down the hygrothermometer. Reference the ASOS Site Technical Manual, Table 5.5.13, for installation of autobalance module.
2. Turn power to the hygrothermometer OFF at the DCP.
3. Remove the 9-pin autobalance connector J2 from its restrained position. Connect J2 to its mating autobalance connector P2 and install the mounting washers and screws.
4. Clean the mirror and calibrate the optical loop using the ASOS Site Technical Manual, Table 5.5.3 or Table 5.5.4.
5. For operation during the summer season, the risk of poor autobalance operation is reduced by having the autobalance cycle occur at night (See General above). The cycle occurs 12 hours after power up and every 24 hours thereafter. For

optimum performance of the autobalance the hygrothermometer should be powered up during the afternoon hours. Remote control of power can be used to initiate the cycle or to correct for mistimed cycles caused by power outages. Proper timing is not mandatory but may be useful for some sites.

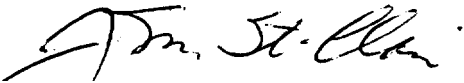
6. Make appropriate entries in the SYSLOG using the Maintenance Action keys, Field Modification keys, and comment field.

Follow these steps:

1. Log on as **TECH** once the modification has been completed.
2. Key the **MAINT** screen.
3. Key the **ACTION** page.
4. Key **FMK** - Enter the modification as follows MOD 27.
On the second line of the screen verify that only MOD 27 is displayed. Complete by entering Y in the Y/N if only MOD 27 is displayed.
5. Check the **SYSLOG** and verify the FMK message. Notify the **AOMC** via telephone the MOD 27 is complete.

REPORTING MODIFICATION

Target date for completing this modification is 30 days after receipt of modification note. Report completed modification on WS Form A-26, Engineering Management Reporting System Maintenance Record, according to instructions in EHB-4, part 2, Appendix F, using reporting code ATDP. Also, record the modification number in block 17(a) as 27 (see attachment for a completed sample of WS Form A-26).



J. Michael St. Clair
Chief, Engineering Division

WS HQ USE ONLY		WS FORM A-26 (4/94) <small>Supersedes WS Form A-23 and WS Form H-28, which are obsolete</small>				<small>U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE</small>		Document Number <h1 style="margin: 0;">G 49978</h1>								
		ENGINEERING MANAGEMENT REPORTING SYSTEM MAINTENANCE RECORD														
General Information		1. Open Date 05 / 30 / 95		Time 0900		2. Initials MRB		3. Response Priority (check one) <input type="radio"/> Immediate <input type="radio"/> Low <input type="radio"/> Routine <input checked="" type="radio"/> Not Applicable		4. Close Date 05 / 30 / 95		Time 1000				
5. Description REACTIVATION OF ASOS HYGRO AUTOBALANCE MODULE																
Equipment Information		6. Station ID ALB		7. Equipment Code ATDP		8. Serial Number T0012			9. TM M		10. AT M		11. How Mal. 999			
12. EQUIPMENT OPERATIONAL STATUS TIMES		a. Fully Operational <div style="border: 1px solid black; height: 20px; width: 80px;"></div>		b. Logistics Delay <div style="border: 1px solid black; height: 20px; width: 80px;"></div>		Partly Operational		c. All Other <div style="border: 1px solid black; height: 20px; width: 80px;"></div>		d. Logistics Delay <div style="border: 1px solid black; height: 20px; width: 80px;"></div>		Not Operational		e. All Other <div style="border: 1px solid black; height: 20px; width: 80px; text-align: center;">01:00</div>		
13. Parts Failure Information												14. Work Load Information				
Block #	a.	ASN	b.	NSN	c.	TM	d.	AT	e.	How Mal.	f.	Qty.	g.	Maint. Hrs.	Type	Staff Hrs.
1															a. Routine	
2															b. Non-routine	
3															c. Travel	
4															d. Misc.	001:30
5															e. Overtime	
Miscellaneous Information		15. Maintenance Comments PERFORMED ASOS MOD NOTE 27 AS DIRECTED												16. Initials MRB		
17. SPECIAL PURPOSE REPORTING		a. Mod. No. 27		b. Mod./Act./Deact. Date 05/30/95		c.		d.		e.						
18. CONFIGURATION MGMT. REPORTING <small>(use as directed)</small>		a. Block #		b. Manufacturer's Part No. of New Part								c. Revision No. of New Part				

SUBJECT : Installation of Video Display Unit

PURPOSE : Addition of the Video Display Unit (VDU) at Small Airports.

EQUIPMENT AFFECTED : ASOS

PARTS REQUIRED : 1 ea Filter 1A9J22
1 ea Video Display Unit
1 ea RS232 cable

MOD PROCUREMENT : VDU, External cable, external modems, adapters and null cables provided by local airport. Internal modems will be provided by NWS. Contact Bobby McCormick (301) 713-1835

SPECIAL TOOLS REQUIRED : None

TIME REQUIRED : 1 hour

EFFECT ON OTHER INSTRUCTIONS : None.

AUTHORIZATION : Agreement for Connection to an Automated Surface Observing System (ASOS) at Federal Aviation Administration (FAA) - Sponsored Expansion Sites and Request for Change SO0669 (NWS3615)

VERIFICATION STATEMENT : This modification was successfully Tested for operational integrity at NWSTC

GENERAL:

This modification note provides instructions to install the Video Display Unit (VDU) at small airports. All material and parts external to the ACU cabinet will be provided by the local

EHB-11

Issuance 95-16

12/5/95

airport requesting a display. Only unused ports on the SIO board are to be used for the VDU installation. The technician will not reassign any existing dedicated factory assigned devices. The cable run for this modification is not to exceed 100 feet in length. If an airport has a requirement for a VDU installation over the 100 foot length, the airport authority will have to provide modems, cables and a dedicated or leased telephone line.

BEFORE BEGINNING PROCEDURE

1. Call the AOMC at 1-800-242-8194. Inform the person who answers the phone at which office you will be completing Modification Note 28. Confirm that AOMC will provide access to the site-specific data base.
2. **Commissioned Sites Only:** Do not start during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of those conditions is expected within 2 hours.
3. Log on as TECH, turn off all report processing, reporting will stop here. Perform the modification MOD 28.

PROCEDURE

VDU Installation at an ASOS Site.

Equipment needed:

1. VDU terminal (provided by the airport authority if required) .
2. Null Modem or Null Modem Cable (provided by the airport authority if required)
3. RS-232 Cable to run from the ACU to the VDU (Only 2 wires needed Signal Ground and Transmit Data from ACU) (provided by the airport authority if required).

Installation:

Log on the ASOS using the laptop computer and check the SIO port before installation of the VDU.

1. Access the REVIEW-SITE-CONFIG-COMMS page and determine if a

port is available on SIO board #2 or higher. If no port is available, an SIO board must be installed.

NOTE :

If a board must be installed, turn the ACU power OFF. Install the board in the next available SIO slot in the VME card rack using ESD precautions. Turn power ON and go to the REVIEW-SITE-CONFIG-HARDWARE configuration page. Configure the additional SIO board.

2. Connect the VDU to the spare SIO port through the 1A9J28 I/O panel on the back of the ACU. The extra 25 pin RS-232 connectors inside the ACU are labeled with the SIO board and port number. When installing a VDU greater than 100 feet away from the ACU, the spare SIO port is connected to an internal modem. The modem output (phone side) should be connected to the next available 2440 modem I/O panel phone port (1A9J12, J13, J14 or J15).
3. It may be necessary to install a surge suppressor jack on the inside of the A9 I/O panel. Connect the internal wire bundle from the SIO port, to the I/O panel. Connect the external cable from the I/O panel to the VDU. If required, order S100-1A9J22 for 1A9J28 and S100-1A9J1 for 1A9J12 from NLSC.
4. Plug the terminal into AC power and configure the terminal. Use Attachment A, VDU Initialization, as a guide to set up terminal parameters. The monitor that the airport manager provides may not be the typical unit used on ASOS. Use the laptop computer to configure the VDU, Log on OID 1 as technician.
5. Go to the REVIEW-SITE-CONFIG-COMMS configuration page. Configure the SIO port selected for the VDU terminal performed. Set the baud rate at 2400, hardware, modem, and stop bits.
6. Verify that the VDU is displaying the 1 minute screen. This completes the installation.

NOTE:

If a remote VDU is required then two modems and a dedicated or leased phone line must be used between the ACU and the VDU terminal. Configuration for the modems can be found in the ASOS

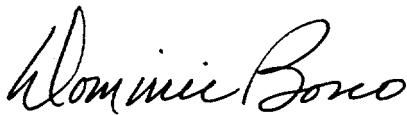
EHB-11
Issuance 95-16
12/5/95

S100 maintenance manual. One change in this procedure however must be noted, one modem is set to the answer mode and the other must be set to the originate mode for them to operate properly, it does not matter which is which.

Reporting Modification:

Target date for completing this modification is 90 days after request from airport manager. Report completed modification on WS Form A-26, Engineering Management Reporting System Maintenance Record, according to instructions in EHB-4, Part 2, Appendix F, using reporting code APER. Also, record the modification number in block 17 (a) as 28. Record the ASN and serial number of the VDU in block 15. (See example for a completed sample of WS Form A-26).

Attachment

A handwritten signature in cursive script that reads "Dominic Bono".

Acting Chief, Engineering Division

ATTACHMENT A
Video Display Unit (VDU) Initialization

THIS IS ONLY A GUIDE

- 1 Connect the Operator Interface Device (OID) keyboard to the VDU (underneath, near front, lower left corner).
- 2 Apply power to the VDU.
- 3 Press function key F3 to enter the setup mode. The VDU will display the General Setup Page 1. If this action fails to display the General Setup page press the Control and F20 keys simultaneously to display the General Setup Page. If you still do not have the General Setup Page the VDU is probably defective.
- 4 Verify Firmware Version: 28 MAR 1991 Ver. 2.07

NOTE

In lower right corner of screen the Setup Directory will be displayed. Function keys F1 through F. are used to display different Setup Pages.

FUNCTION KEY	PAGE
F1	General Setup
F2	Communication Setup
F3	Display Setup
F4	Keyboard Setup
F5	ANSI Setup
F6	Function Key Setup
F7	Tabs Setup
F8	Answer back Setup
F9	Exit

Other available commands in the Setup Mode are:

D Resets terminal configuration to the factory default
E Exit Setup Mode
H Help
S Saves all current settings in non-volatile memory

EHB-11
Issuance 95-16
12/5/95

5. General Setup Page F1

Emulation	VT220-7	Auto Page	Off
Enhancements	Off	Warning Bell	On
Virtual terminal	Off	Margin Bell	Off
Scroll Style	Jump	Bell Sound	1
Auto Scroll	On	Block Terminator	US\CR
Auto Wrap	On	Send ACK	Off
Received CR	CR	Monitor Mode	Off

6. Communication Setup F2

Main Baud	9600	Aux Baud	9600
Main Data-parity	8/None	Aux Data/parity	8/None
Main Stop Bits	1	Aux Stop Bits	1
Ignore 8th Bit	Off	Aux Rev Hndsk	XON/XOFF
Main Rcv Hndsk	XON/XOFF	Aux Xmt Hndsk	None
Main Xmt Hndsk	None	Aux Port	RS232
Comm Mode	Full Duplex	Aux Interface	RS232
Disconnect	2 Set	Printer	Parallel

7. Display Setup F3

Columns	80	Background	Dark
80/132 Clear	On	Attributes	Char
Lines	24	Wprt Intensity	Dim
Pages	1xLines	Wprt Reverse	Off
* Status Line	Off	Wprt Underline	Off
Cursor Style	Blink Block	Refresh Rate	60 Hz
* Cursor	Off	Pound Char	us
Screen Saver	15 Min	Auto Font Load	On

*= Not Factory Default Setting

8. Keyboard Setup F4

Key Click	On	Compose Key	Funct
Key Repeat	On	Break	250 ms
Key Lock	Caps	Xmt Limit	None
Return Key	CR	Fkey Xmt Limit	Notice
Enter Key	CR	Key Code	ASCII
Erase Key	DEL/BS	Language	us

9. ANSI Setup F5

Fkey Lock	Off	Print	National
Feature Lock	Off	Send	All
Key Pad	Numeric	Send Area	Screen

Cursor Keys	Normal	Print Area	Screen
Xfer Term	EOS	Send Term	None
Char Mode	Multinational	Print Term	None
Keys	Typewriter	Print Mode	Normal
VT100 ID	VT100	Auto Answer back	Off

10. Function Key Setup F6
None
11. Tabs Setup F7
None
12. Answer back Setup F8
None
13. Press Function Key F1
14. Save Configuration, press S
15. Exit Setup Mode, press F9
16. Disconnect power from VDU
17. Disconnect keyboard from VDU

EHB-11
 Issuance 95-16
 12/5/95

WS SE ONLY		WS FORM A-26 (4-94) <small>Supersedes WS Form A-23 and WS Form A-25 which are obsolete</small>				<small>U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE</small>		Document Number <h1 style="margin: 0;">G 49978</h1>							
ENGINEERING MANAGEMENT REPORTING SYSTEM MAINTENANCE RECORD															
General Information		1. Open Date 10 / 24 / 95		Time 0900		2. Initials MRB		3. Response Priority (check one) <input type="radio"/> Immediate <input type="radio"/> Low <input type="radio"/> Routine <input checked="" type="radio"/> Not Applicable		4. Close Date 10 / 24 / 95		Time 1000			
5. Description <h2 style="text-align: center; margin: 0;">INSTALL VIDEO UNIT I. A. W. MDD NOTE 28</h2>															
Equipment Information		6. Station ID ABR		7. Equipment Code APER		8. Serial Number 001		9. TM M		10. AT M		11. How Mal. 999			
12. EQUIPMENT OPERATIONAL STATUS TIMES		a. Fully Operational <div style="border: 1px solid black; height: 20px; width: 80px; margin: 0 auto;"></div>		b. Logistics Delay <div style="border: 1px solid black; height: 20px; width: 80px; margin: 0 auto;"></div>		Partly Operational		c. All Other <div style="border: 1px solid black; height: 20px; width: 80px; margin: 0 auto;"></div>		d. Logistics Delay <div style="border: 1px solid black; height: 20px; width: 80px; margin: 0 auto;"></div>		Not Operational		e. All Other <div style="border: 1px solid black; padding: 2px; text-align: center;">01:00</div>	
13. Parts Failure Information										14. Work Load Information					
Block #	a.	ASN	b.	NSN	c.	d.	e.	f.	g.	Type	Staff Hrs.				
1					TM	AT	How Mal.	Qty.	Maint. Hrs.	a. Routine					
2										b. Non-routine					
3										c. Travel					
4										d. Misc.	001:00				
5										e. Overtime					
Miscellaneous Information		15. Maintenance Comments <h2 style="text-align: center; margin: 0;">PERFORMED MDD NOTE 28 AS DIRECTED; INSTALLED NEW VDU (ASN: S100-81; S/N: 1234)</h2>										16. Initials MRB			
17. SPECIAL PURPOSE REPORTING		a. Mod. No. 28		b. Mod./Act./Deact. Date 10/24/95		c.		d.		e.					
18. CONFIGURATION MGMT. REPORTING <small>(use as directed)</small>		a. Block #		b. Manufacturer's Part No. of New Part						c. Revision No. of New Part					

SUBJECT : Installation of 3K ohm resistor on wind sensor

PURPOSE : Eliminate the wind sensor data quality error caused by under current condition.

EQUIPMENT : ASOS wind sensor
AFFECTED

PARTS REQUIRED : 1 (ea) Resistor 3K ohm 10 watt or 2 (ea) 6K ohm 5 watt resistors.

MOD PROCUREMENT: None

SPECIAL TOOLS : None
REQUIRED

TIME REQUIRED : 1 hour

EFFECT ON OTHER: None
INSTRUCTIONS

AUTHORIZATION : This modification is authorized by ECP AP003 (S00683).
Approved with Changes by SRG on 6/15/95

VERIFICATION : Modification was tested at two sites; SAT and ELP
STATEMENT

General:

The purpose of this modification note is to provide installation instructions for a 3K ohm 10 watt resistor or two 6K ohm 5 watt resistors in parallel in the wind sensor electronics enclosure. The resistor is placed between the line out and ground on the EMI filter E2. Wind sensor data quality errors caused by an undercurrent condition will be eliminated. The resistors are to be purchased locally. This modification should be implemented only on systems that are experiencing chronic SYSLOG reports "ST 0367 DCP #1 Wind sensor power commanded ON remained OFF" and are being commissioned prior to 9/15/95. ACU firmware version 2.2 will correct the data quality error reporting. The resistor(s) will be removed as a part of the ACU firmware version 2.2 modification note.

BEFORE BEGINNING PROCEDURE

1. Get approval of the responsible MIC/OIC before starting deactivation. You may complete modification on any day of the month if permission is granted and the restrictions in steps 3 and 4 are complied with.
2. **Commissioned Sites Only:** Do not start during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of those conditions is expected within 3 hours. These meteorological conditions will be defined by the responsible MIC/OIC.
3. Do not start at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Although 10 minutes should be sufficient, allow 0.5 hour to complete.
4. Immediately before beginning work at NWS staffed sites, the MIC/OIC/observer will inform the tower and any other critical users that the wind sensor will be shut off (unstaffed sites, the el tech will inform tower).
5. Do not begin until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.
6. Call the AOMC at 1-800-242-8194. Inform the person who answers the phone at which office you will be completing modification note 29.
7. Log on as TECH, turn OFF report processing for the wind sensor.
 1. Key the **MAINT** screen
 2. Key the **ACTION** page.
 3. Press the **Start** key
 4. Exit, log off as **TECH**.

Procedure:

1. Remove the power to the wind sensor inside the DCP cabinet. Ensure that the circuit breaker is set to the right, for the OFF position.
2. Reference the ASOS Site Technical Manual, chapter 4, page 4-7, figure 4.2.1 to open the wind sensor electronics enclosure. Use a Phillips screw driver No.1, and remove the six screws from the power input box access cover.
3. Reference the ASOS Site Technical Manual, chapter 4, page 4-20.1, figure 4.4.2., wind sensor block diagram (sheet 2 of 2) change 2.

Note:

A line is shown drawn across Line Out (LO) and Ground (GND) on the EMI filter E2; this line should be removed from the figure.

4. Locate EMI filter E2 in the power input box A1. Remove the nuts from the terminals marked LO and GND.
5. Install the 3k ohm 10 watt resistor between the LO and GND terminals. Wrap the resistor leads around the LO and GND terminals. If a 3K ohm 10 watt resistor is not available, two 6K ohm 5 watt resistors can be used in parallel across the LO and GND terminals.
6. Install the nuts removed from the LO and GND terminals.
7. Install the power input box access cover removed in step 2. Use a No. 1 Phillips screw driver for the installation of the screws.
8. Close the wind sensor electronics enclosure.
9. Restore power to the wind sensor inside the DCP cabinet. Ensure that the circuit breaker is set to the left, for the ON position.

This completes the modification.

10. Make appropriate entries in the SYSLOG using the Maintenance Action keys, Field Modification keys, and comment field.

Follow these steps:

1. Log on as **TECH** once the modification has been completed.
2. Key the **MAINT** screen
3. Key the **ACTION** page
4. Key **FMK**- Enter the modification as follows MOD 29.
On the second line of the screen verify that only MOD 29 is displayed. Complete by entering Y in the Y/N if only MOD 29 is displayed.
5. Check the SYSLOG and verify the FMK message. Clear any maintenance flags or errors caused by this modification. Notify the **AOMC** via a telephone that MOD 29 is complete.

REPORTING MODIFICATION

Target date for completion of this modification is 30 days after receipt. Report completed modification on WS Form A-26 maintenance record, per instructions in EHB-4, Part 2, Appendix F, using reporting code **AWIND**.


Acting Chief, Engineering Division

WS HQ USE ONLY		WS FORM A-26 (4/94) <small>Supersedes WS Form A-23 and WS Form H-28, which are obsolete.</small>				U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE		Document Number <h1 style="margin: 0;">G 49978</h1>							
ENGINEERING MANAGEMENT REPORTING SYSTEM MAINTENANCE RECORD															
General Information		1. Open Date 06 / 26 / 95		Time 0900		2. Initials MRB		3. Response Priority (check one) <input type="radio"/> Immediate <input type="radio"/> Low <input type="radio"/> Routine <input checked="" type="radio"/> Not Applicable		4. Close Date 06 / 26 / 95		Time 1100			
5. Description INSTALLATION OF 3K ohm RESGISTER ON WND SENSOR															
Equipment Information		6. Station ID OFP		7. Equipment Code AWIND		8. Serial Number A0385		9. TM M		10. AT M		11. How Mal. 999			
12. EQUIPMENT OPERATIONAL STATUS TIMES		a. Fully Operational <div style="border: 1px solid black; height: 20px; width: 80px;"></div>		b. Logistics Delay <div style="border: 1px solid black; height: 20px; width: 80px;"></div>		Partly Operational		c. All Other <div style="border: 1px solid black; height: 20px; width: 80px;"></div>		d. Logistics Delay <div style="border: 1px solid black; height: 20px; width: 80px;"></div>		Not Operational		e. All Other <div style="border: 1px solid black; height: 20px; width: 80px; text-align: center;">02:00</div>	
13. Parts Failure Information												14. Work Load Information			
Block #	a. ASN	b. NSN	c. TM	d. AT	e. How Mal.	f. Qty.	g. Maint. Hrs.	Type	Staff Hrs.						
1								a. Routine							
2								b. Non-routine							
3								c. Travel							
4								d. Misc.	002:00						
5								e. Overtime							
Miscellaneous Information		15. Maintenance Comments								16. Initials MRB					
17. SPECIAL PURPOSE REPORTING		a. Mod. No. 29		b. Mod./Act./Deact. Date 06/26/95		c.		d.		e.					
18. CONFIGURATION MGMT. REPORTING <small>(use as directed)</small>		a. Block #		b. Manufacturer's Part No. of New Part						c. Revision No. of New Part					

ASOS MODIFICATION NOTE 31 (for Electronics Technicians)

Engineering Division

W/OSO32I:BGM/AJW

SUBJECT : ACU Memory Firmware Version 2.3 and ACU CPU Firmware 1.81

PURPOSE : To add Freezing Rain, preliminary Meteorological Aviation Report (METAR) and ASOS Controller Equipment (ACE) enhancements.

EQUIPMENT AFFECTED : ASOS Acquisition Control Unit (AACU)

PARTS REQUIRED : CPU Microcircuit P/N 62828-45000
CPU Microcircuit P/N 62828-45001
ACU Memory Microcircuit P/N 62828-45002
ACU Memory Microcircuit P/N 62828-45003
ACU Memory Microcircuit P/N 62828-45004
ACU Memory Microcircuit P/N 62828-45005
RAM Chips PIN 62828-90036-1 (4 ea.)
Label, ACU Memory Card
Stuffing Chart Label, ACU

MOD PROCUREMENT: The above parts are available through NLSC and are only available for each site listed in Appendix E. Technicians should order one set of CPU EPROMS, S100-1A2A1-U29 for each ACU CPU when upgrading to 1.81 (two sets per system). Order one set of ACU memory EPROMS, S100-1A2A3-U8A, and S100-FMK059 which includes four RAM chips, S100-1A2A3U24 and two labels, one memory board label and one ACU stuffing chart label. Return old EPROMS to NRC.

SPECIAL TOOLS : IC insertion tool
REQUIRED Small flat blade screwdriver
Conductive foam
Electrostatic discharge (ESD) straps

TIME REQUIRED : 1 hour

EFFECT ON OTHER: EHB-11, section 3.6, Modification Note 32 must
INSTRUCTIONS be installed in conjunction with this modification. This modification note supersedes Modification Note 20, including errata, and Mod 14. Remove Modification Note 29, if installed, before starting this modification.

AUTHORIZATION : This modification is authorized by ECPs E94SM05F112, E94SM05F120, and E95SM05F142

AUTHORIZATION : This modification is authorized by ECPs E94SM05F112, E94SM05F120, and E95SM05F142

VERIFICATION : This modification has been tested for
STATEMENT operational integrity at the sites listed in Appendix B and the Engineering Design Branch laboratory.

GENERAL

This modification note provides procedures to upgrade the ASOS software by removing and replacing erasable programmable read only memory (EPROM) and adding random access memory (RAM). This note provides procedures for "Before Installing Firmware" and "After Installing Firmware." Appendix C contains information on changes and corrections implemented in firmware version 2.3. Before installing Modification Note 31, reference EHB-11, section 3.6, ASOS Modification Notes 32. The voice processor firmware, Modification Note 32, is required to be installed in conjunction with this modification.

PROCEDURE

The following installation instructions are for EPROMs U8, U7, U17, and U21, RAM chips U46, U47, U52, U53 on the ACU memory board 1A2A3. Installation instructions are also for EPROMs U29 and U30 on the ACU CPU boards 1A2A1 and 1A2A2 when upgrading to version 1.81. The instructions also include placement information for the ACU stuffing chart label and the ACU memory board part number label.

CAUTION

Be careful to protect the electronics on the ACU memory and CPU boards during this procedure. Do not reconfigure any jumpers on the ACU memory or the ACU CPU boards unless instructed to do so by the procedure.

BEFORE INSTALLING FIRMWARE

1. Call the AOMC at 1-800-242-8194 and provide notification on which ASOS you will be installing new firmware. Confirm that the AOMC will provide access to the site-specific data base. Coordinate with the AOMC so the data base is available. Upload the current configuration before installing the new firmware.
2. Get approval of the responsible MIC/OIC before starting installation. You may install on any day of the month if restrictions in steps 3 and 4 are satisfied.
3. **Commissioned Sites Only:** Do not start installation during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of these conditions are expected within 3 hours. The responsible MIC/OIC will define these meteorological conditions.

5. Immediately before beginning work at NWS staffed sites, the MIC/OIC/Observer will inform the tower and any other critical users that ASOS will be shut off for firmware upgrade. At an unstaffed site, the el tech will inform the tower using Controller Video Displays (CVD) and Operator Interface Devices (OID) to log off and shut down display power to avoid confusion. Commissioned sites only, are to download the following data to the laptop using the direct command mode: 5-minute data (12 hrs.), SYSLOG information (24 hrs.), SHEF messages (24 hrs.), and any 2-hour archive files.
6. Do not begin the installation process, i.e., halt ASOS, until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.
7. Disable all hardwire and dial communication ports to AFOS (REVUE-SITE-CONFIG-COMMS). Go into the AOMC page (REVUE-SITE-VERSN-AOMC); wait for the external communication and the site physical lines to change from "AUTO UPLOAD REQ" to "COMPLETE" before going to the next step. The system voice function will automatically broadcast a "not available" message when the ACU power is turned off.
8. Make the appropriate SYSLOG entries (MAINT-ACT-FMK) Mod 31:
 1. Log on as **TECH**.
 2. Key the **MAINT** screen.
 3. Key the **ACT** page.
 4. Key **START** - Stop here and perform Mod 31.
Upon completion of the Mod 31, log onto the system.
9. Continue with Appendix A, Instructions for ASOS Software Version Upgrade. Once the steps in Appendix A have been completed, continue with "After Installing Firmware," step 10.

AFTER INSTALLING FIRMWARE

See page 4 for a description of the time required to reboot ASOS and sensor response time after a new firmware load.

10. When ASOS is restarted at unstaffed sites, call to inform towers using CVDs and OIDs to turn on their displays. (At staffed sites, the MIC/OIC/Observer will call the tower.)
11. If on-site NWS staff provides backup while the installation is underway, no special observation is needed when ASOS is restarted. Proceed to step 12.

If there is no backup at a site and a record observation was missed during the installation, a special observation must be taken when ASOS is restarted. The el tech should take the following steps at the ASOS keyboard after installation:

1. Press [SIGN].
2. Type his/her initials and press [RETURN],
3. Type the observer level password and press [RETURN].
4. Press [GENOBJ].
5. Press [SPECL].
6. Press [EXIT].
7. Press [SIGN].

If there is no backup at a site and a record observation was missed during the installation, a special observation must be taken when ASOS is restarted. The el tech should take the following steps at the ASOS keyboard after installation:

1. Press [SIGN].
2. Type his/her initials and press [RETURN].
3. Type the observer level password and press [RETURN].
4. Press [GENOB].
5. Press [SPECL].
6. Press [EXIT].
7. Press [SIGN].
8. Type his/her initials again and press [RETURN].
9. Press [RETURN] twice. This signs the "observer" off ASOS.
10. Leave ASOS running.

Note: The "observer" must sign off before the 5-minute edit time is up.

12. Inform the office staff that ASOS is again operational. If less than 25 minutes remain until the next hourly observation, augmentation of the ceiling may be required. It may be necessary to augment several elements or even the entire observation. The chart below indicates how long it takes after a start up for ASOS to report each observation element automatically.

Times Needed for Elements to be Reported Automatically

	<u>Minimum</u>	<u>Maximum</u>
Pressure		
Precipitation Amount	60 seconds	*
Wind direction	2 minutes	7 minutes
Wind speed	2 minutes	7 minutes
Precipitation Type	2 minutes	*
Temperature	5 minutes	10 minutes
Dew Point	5 minutes	10 minutes
Visibility	10 minutes	15 minutes
Obstruction to Visibility	10 minutes	*
Ceiling	30 minutes	35 minutes

* Maximum time not applicable since phenomena may not be present. Minimum time applies if phenomena are present.

13. Verify that ASOS transmitted an hourly observation. Call the AOMC at 1-800-242-8194 and tell the operator:
 1. Your location;
 2. That installation of the new firmware has been completed;
 3. That ASOS is operational.

14. Enter in the SYSLOG that maintenance has been completed.
 1. Key the **MAINT** screen.
 2. Key the **ACT** page.
 3. Key **FMK** - Enter the Field Mod Kit (FMK) number as follows: **Mod 31**.
On the second line of the screen verify that only **Mod 31** is displayed. Complete by entering Y in the Y/N if only **Mod 31** is displayed. If mods 31 and 32 were completed, make appropriate log entries.
 4. Check the **SYSLOG** and verify the **FMK** message. **Enter a comment in the SYSLOG stating that version 2.3 has been installed. Notify the AOMC via telephone that Mod 31, version 2.3 and any other Mods have been completed.**
15. At an expansion site with ATCT, the el tech will contact the ATCT and supply information on the following:
 1. ASOS maintenance is completed.
 2. ASOS is restored to service.
 3. Tower CVDs and OIDs need to be turned on, and TRACON displays need to be turned on.

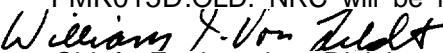
Reporting Modification

Target date for completion of this modification is 30 days after receipt of parts. Report completed modification on a Weather Service Form A-26 maintenance record, per instructions in EHB4, Part 2, Appendix F, using reporting code AACU. **Add in the comment field that version 2.3 was installed.** If this modification is installed in conjunction with Modification Note 32, a separate Weather Service Form A-26 must be completed for each modification note.

Also, record the modification number in block 17(A) as 31 (see Appendix D for a completed sample of WS Form A-26).

NOTE:

Parts removed (EPROMs) should be properly packed and returned to NRC as S100-FMK015D.OLD. NRC will be reprogramming the EPROMs for other ASOS applications.


Acting Chief, Engineering Division

Appendix A
Appendix B
Appendix C
Appendix D
Appendix E

INSTRUCTIONS

FIELD MODIFICATION KIT - ASOS SOFTWARE VERSION UPGRADE

1. UPGRADING ASOS SOFTWARE

1.1 GENERAL

All ASOS application software is contained on the four erasable programmable read only memory (EPROM) integrated circuits (IC) on ACU memory board 1A2A3. Figure 1 illustrates the ACU memory board and identifies the four EPROMs (U8, U17, U7, and U21). The EPROMs are 32-pin dual in-line package (DIP) CMOS devices, each providing 512K x 8 bits of storage. Upgrading ASOS software requires only replacing the four EPROMs on the ACU memory board with higher revision level ICs.

Figure 1 also identifies the four additional RAM chips (U46, U47, U52 and U53). The RAM chips are 32-pin DIP CMOS devices, each providing 128K x 8 bits of storage. There will be no jumpers or switch setting changes to the board. One RAM chip is added to the top of the clock socket/chip (U52). This causes the chip to protrude into the next card slot position.

All ASOS operating software is contained on two EPROM ICs on each ACU CPU board 1A2A1 and 1A2A2. Figure 2 illustrates the ACU CPU board and identifies the two EPROMs (U29 and U30). The EPROMs are 28-pin DIP CMOS devices, each providing 256K x 8 bits of storage. Upgrading pSOS ASOS software requires only replacing the two EPROMs on each ACU CPU board with higher revision level ICs.

The four EPROMs on the ACU memory board contain both the ACU application program and the DCP application program. The ACU CPU runs the ACU application program directly from the ACU memory board. The DCP application program must first be downloaded from the ACU memory board to RAM storage in the DCP before it can be run by the DCP CPU.

Sites without a local OID (i.e., no RS232 connected for the primary OID) should attach a terminal to the primary OID port of the ACU 1A9J22 before proceeding.

1.2 SOFTWARE UPGRADE PROCEDURE

This procedure provides instructions to upgrade ASOS software by removing and replacing the four EPROMs and adding four RAM chips on the ACU memory board. This procedure also provides instructions to upgrade two EPROMS on each of the ACU CPU boards to version 1.81. After new EPROMs are installed, this procedure cold starts both the ACU and associated DCPs.

If the ACU EPROMs in the system are 1.70 or higher, the ACU is no longer cold started by removing battery jumper J22 (Figure 1) to clear all RAM on the board. The next step requires receiving a download of site-specific data from the AOMC. The DCPs are cold started by

performing a hard reset of each DCP from the processor status page on the OID. After completion of the upgrade procedure, the EPROMs removed from the ACU memory board should be packaged in appropriate electrostatic discharge (ESD) protective material for return to NRC.

NOTE:

There may be an approximate 20-minute wait required to access the AOMC.

Step

1. If the printer is on-line, place it off-line by pressing the **ON-LINE** switch located on the printer front panel.

CAUTION

Damage to equipment may result if power is not removed prior to removal or installation. Ensure that OUTPUT POWER switch is set to 0 (OFF) and facility power is removed.

To avoid damage to circuit boards and integrated circuits, use proper ESD handling procedures, including using a grounding strap when performing the following steps.

2. Set OUTPUT POWER switch on UPS status panel to 0 (OFF) position. The indicator for the OUTPUT status panel extinguishes. (This step is only required on systems with a UPS).
3. Remove facility AC power from ACU cabinet.
4. Using a small flat blade screwdriver, loosen the captive screws located at top and bottom of ACU memory board 1A2A3. Loosen captive screws located at top and bottom of the ACU CPU boards 1A2A1 and 1A2A2 if ACU CPU firmware has not been upgraded to version 1.81.
5. Press extractor handles at top and bottom of ACU CPU boards 1A2A1, 1A2A2 if required and ACU memory board 1A2A3 in opposite directions to release board. Remove board from rack.
6. On the underside of the ACU memory board, using a flat blade screwdriver, remove three screws and flat washers securing front panel to board. Remove board from front panel.
7. If the ACU EPROMS in the system are 1.70 or higher proceed to step 8, otherwise continue with step 7. Remove battery jumper J22 from ACU memory card. The jumper will be reinstalled during the installation procedure.

CAUTION

Throughout this procedure, discharge the screwdriver before and during use by touching tool to the grounded chassis surface.

Failure to comply may result in damage to the integrated circuits.

8. From the front of the board, slide small flat blade screwdriver between integrated circuit U7 and its IC socket. Carefully lift up on U7 to remove it from the socket as evenly as possible. After U7 is removed from the socket, place in a conductive foam or on some other static-free surface.
9. Repeat Step 8 for removal of the following integrated circuits U8, U17 and U21.
10. If required, remove U29 and U30 from the ACU CPU printed circuit boards 1A2A1 and 1A2A2 sockets and place the removed integrated circuits in a conductive foam or on some other static-free surface.

CAUTION

The ACU memory board has a battery that keeps voltage on the RAM sockets. **DO NOT** use a metal insertion tool when installing the RAM ICs. Avoid shorting out the voltage and ground pins. Shorting out the voltage pin will corrupt any stored data and is similar to performing a cold boot.

11. Using the IC insertion tool, remove the new EPROM ICs from protective packaging and insert them into the ACU memory board sockets in accordance with the following chart. Ensure that the EPROMs are installed with pin 1 (as identified by notch in top of IC) oriented toward board connector P1 and P2 as shown on Figure 1.

<u>IC socket</u>	<u>IC part number</u>
U8	62828-45002-1
U17	62828-45003-1
U7	62828-45004-1
U21	62828-45005-1

12. Using the IC insertion tool, remove the RAM ICs from protective packaging and insert them into the ACU memory board sockets U46, U47, U52 and U53. Ensure that the RAMs are installed with pin 1 (as identified by notch in top of IC) oriented toward board connector P1 and P2 as shown on Figure 1. U52 already has a clock chip installed. **DO NOT REMOVE THE CLOCK CHIP.** Install the RAM chip on top of the clock chip.

13. Remove the part number label (ASSY 62828-47008-10) from the ACU memory card and install the new label (ASSY 62828-47008-20) in the same location.
14. Use a small flat blade screwdriver, and install the three flat washers and screws. This will secure the front panel to the board.
15. With the RAM chip stacked on top of the clock chip, the RAM chip protrudes into the next card slot. Remove the board or blank panel in VME slot 1A2A4.
16. Hold the ACU memory board by handles, position the board with the component side facing to the right and carefully slide board into VME slot 1A2A3. Align the board with the rear connector and press into place. Reinstall the 1A2A4 board or blank panel.
17. Use a small flat blade screwdriver and tighten the captive screws located at top and bottom of boards and blank panels.
18. If required, remove the new EPROM ICs from the protective packaging. Use an IC insertion tool to insert the EPROMs into the ACU CPU board's sockets (1A2A1 and 1A2A2) in accordance with the following chart. Ensure that all the EPROMs are installed with pin 1 (as identified by notch in top of IC) oriented toward the top of the ACU CPU board as shown on Figure 2.

<u>IC socket</u>	<u>IC part number</u>
U29	62828-450001
U30	62828-45001-1

19. If required, hold the ACU CPU board by the handles, position the board with the component side facing to the right and carefully slide board into the card rack on its guides. Align the board with the rear connector and press into place.
20. If required, use a small flat blade screwdriver, and tighten the captive screws located at the top and bottom of the ACU CPU board.
21. Install the stuffing chart label directly over the stuffing chart located on the inside of ACU back door. Center the stuffing chart label over the ACU memory board section of the chart.
22. This completes Modification Note 31. Complete Modification Note 32 before going to step 22.
23. Apply facility power to ACU cabinet. Set OUTPUT POWER switch to 1 (ON) position. (This step is not required for systems that do not have a UPS).
24. After the power is applied to the ACU, one of the PASS (Green) LEDs on the CPU should illuminate and the PASS LED on the other CPU will remain off. After approximately 1 minute, the LED that was off should start blinking.

not occur, return to REMOVAL procedure, step 1. Follow the steps until the ACU memory board is removed. Ensure the ACU EPROMs are installed correctly. Follow the INSTALLATION procedures to replace the ACU memory board.

27. At the OID, sign onto system as a "Technician."
28. Display the external communications page on the OID (sequentially press REVUE-SITE-CO-NFG-EXTRN keys from 1-minute display). Enter both AOMC phone numbers (1-800-253-4717 & 1-800-434-I 133) into the AOMC PHONE NUMBER field and press the EXIT function key.
29. Display the site physical page on the OID (sequentially press REVUE-SITE-PHYS function keys from 1-minute display). Enter the three or four character SID code in the STATION IDENTIFIER field and press the EXIT function key. The system then calls the AOMC and receives a download of site-specific data.
30. Display the AOMC version page on the OID (sequentially press REVUE-SITE-VERSN-AOMC function keys from 1-minute display). This will allow you to observe that all the files are being downloaded from the AOMC. All status fields should read "COMPLETE" in approximately 5 minutes. Press EXIT.

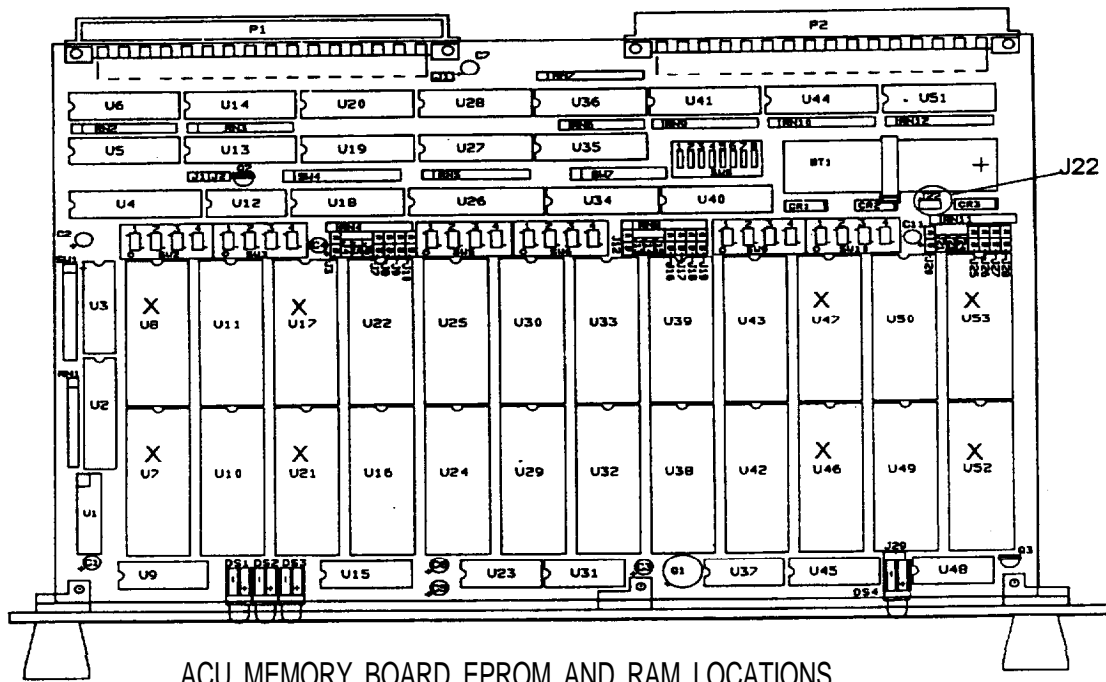
NOTE: The following steps cold start the DCPs.

31. Display the maintenance page on the OID (press the MAINT function key from 1-minute display).
32. Use the PREV/NEXT keys, position the cursor over PROC field and press the SEL key. The OID displays the processor status page.
33. Use the PREV/NEXT keys, position the cursor over DCP #1 - HARD field and press the RESET key. Respond "YES" and "ENTER" to the "ARE YOU SURE?" message. The corresponding status field displays INITIALIZING while the unit is initializing. The progress of the download can be monitored by the PERCENT COMPLETE message that appears at the top of the screen. When the percent complete reaches 100, the DCP status field changes to RUNNING.
34. If the system contains more than one DCP, repeat step 31 for DCPs #2 and #3 as required.

FINAL ACTIONS

1. After the Mod has been completed, clear any maintenance flags that occur as a result of the restart.
2. Display the SW version page on the OID (sequentially press REVUE-SITE-VERSN-SW function keys from 1-minute display). The following fields should display version 2.3: MEMORY ACU APPLICATION EPROM, MEMORY DCP APPLICATION EPROM, and MEMORY DCP APPLICATION RAM. PSOS field should display "CPU A PSOS OS EPROM 1.81" and "CPU B pSOS OS EPROM 1.81. "(These fields may take 5-10 minutes before they all read 2.3.)
3. When upgrading from ACU firmware 2.2 or later this step is not required. Technicians should enter site identifications for each AFOS dial backup telephone number. SHEF addresses must be entered on the external communications page. Specific addresses can be obtained from the local MIC/OIC. AFOS backup block and the AOMC 1200 baud fields should be N, for all sites in the CONUS.
4. ***With the installation of firmware 2.3, the freezing nlin sensor must be configured in accordance with the ASOS site technical manual S100, chapter 1, paragraph 1.3.10.3, table 1.3.2.1.***
5. Sites with GTA radios should be configured in accordance with the ASOS site technical manual S100, chapter 12, paragraph 12.3.5.1.

ASSEMBLY DRAWING



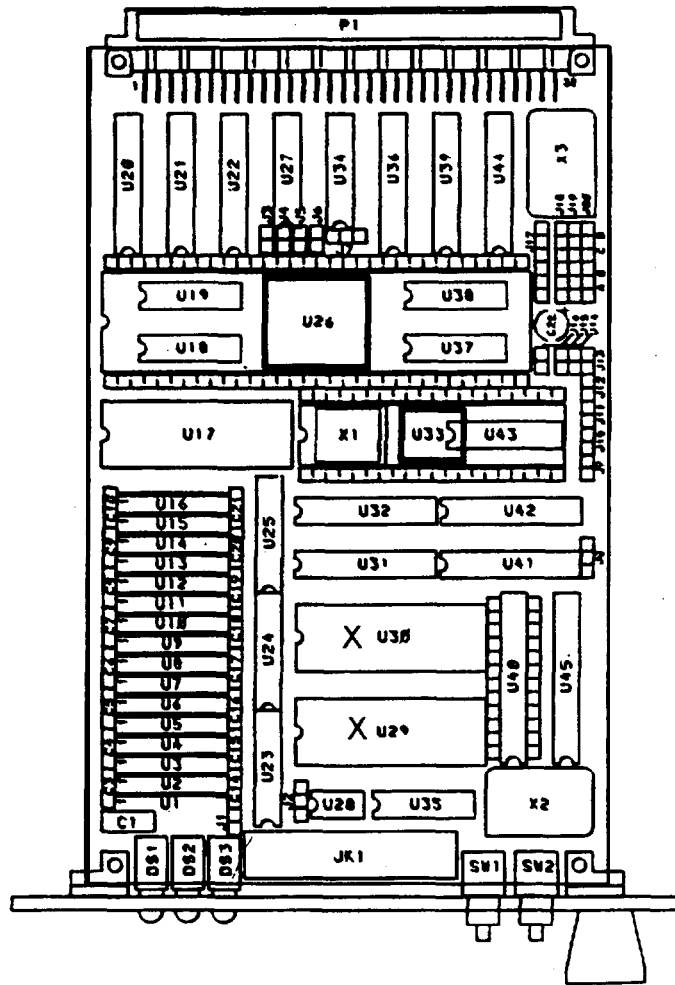
ACU MEMORY BOARD EPROM AND RAM LOCATIONS

FIGURE 1

EPROM
U7
U8
U17
U21

RAM
U46
U47
U52
U53

ASSEMBLY DRAWING



CPU BOARD

EPROM
U29
U30

FIGURE 2

The test sites for version 2.25 are:

NWS Southern Region

AHN -Athens, GA
3R5 - New Braunfels, TX
ABQ - Albuquerque, NM
MIA - Miami, FL

NWS Central Region

FAR - Fargo, ND

NWS Western Region

SLC - Salt Lake City, UT

NWS Alaska Region

ANC - Anchorage, AK

Operational Trouble Reports (OTR) Fixed in V2.3

This appendix is a subsection of the Software release note published by the Field Systems Branch, OSO13. The software release note describing the detail changes to ASOS software version 2.3 is available from Frank Lucadamo, 301-713-0386 ext. 186, and should be read by all technicians. Electronic distributions are also available.

If it becomes necessary, the electronics technician can edit the default METAR implementation date of June 1, 1996. Other changes which affect the electronics technician are described below.

ITEM	TITLE/COMMENTS	PROBLEM	SOLUTION
1	Missing SYSLOG entry for editing of altimeter setting.	When the observer edits the altimeter field, an entry is not made in the SYSLOG to inform the technician that report processing was turned off.	When the observer EDITS the altimeter field, the message noting that report processing for the pressure sensors was turned off is now displayed in the SYSLOG.
2	Null field for AOMC phone number causes problems.	If no phone number (i.e., blank field) was entered in the AOMC primary phone number field on the REVUE SITE CONFIG EXTRN page, and the system was warm boot or the system configuration was changed, ASOS would report invalid data without any maintenance flag (\$).	A blank field for AOMC phone number entered on REVUE SITE CONFIG EXTRN page will not cause invalid data to be reported by ASOS. NOTE: Even though this is true, the AOMC primary and secondary phone numbers should be entered in these fields.
3	Visibility sensor diagnostics running check.	The visibility sensor hardware was modified to include improved sensor heater diagnostics.	ASOS will check the visibility code for heater diagnostics. If the temperature falls below 25°F and the heater is not turned on, the diagnostics will turn the heater on.
4	Invalid phone SYSLOG message.	Message "Phone #xxx Successful" was logged even though the reply option was set to NO.	Code was modified so the message "Phone #xxx Successful" appears only when the reply status is YES.
5	5 is incorrectly displayed in SAO when ASOS is using battery input power.	When the ACU or DCP goes to battery input power, a \$ was appended to the SAO. This should not occur. This problem occurred only with the Deltec UPS.	The code was corrected so a \$ is not displayed when the ACU or DCP is on battery backup power.

ITEM	TITLE/COMMENTS	PROBLEM	SOLUTION
6	Single cabinet ACU modifications.	Some ASOS sites do not have DCPs due to space problems. The ACU could handle only three local sensors.	Added 10 additional local sensors, added single-cabinet detect mode, and change power maintenance pages to handle normal ACU operation and single-cabinet mode operation.

This appendix summarizes the modifications made when ASOS version 2.0 was upgraded to 2.2. These changes are still valid in version 2.3. Sites upgraded from 2.0 to 2.3 must read this material.

The following abbreviations are used below to signify the user/system area who is impacted by the software change:

ALG - algorithm change; ATC - air traffic controller;
OBS - observer; SYS - system manager;
SYSCH - system change; TEC - electronics technician;
UNS - unsigned user;

User TITLE/Summary

- ALG **Missing Wind Data Flags on Daily Summary** - Wind data continued to be updated on the daily summary page after report processing was turned off. The daily summary now reports "E" for estimated wind data.
- ALG **Incorrect Present Weather Remark** - The system generated lengthy remarks during intermittent LEDWI operation (e.g., SEMMB17SEMMB22SEMMB36SEMMB36SEMM PWINO). ASOS now simplifies the remark to SEMM PWINO.
- ALG **Rain Gauge Processing Deficiency** - ASOS continued to update precipitation parameters (24-hour precipitation and daily summary) after report processing was turned off for the tipping bucket. ASOS now ignores these tips.
- ALG **Incorrect Daily Weather Code on Daily Summary** - The code "x" for tornado was entered on the daily summary even though the USP for tornado was aborted. The USP must now be transmitted before the code is updated on the daily summary.
- ALG **Missing "E" Prefix for Edited Wind 5-MIN OBS** - The "E" prefix from 5-MIN OBS wind report was missing after an observer edit. "E" now correctly shows up in 5-MIN OBS.
- ALG **Invalid Pressure Remark in SAO when Pressure Missing** - After pressure sensors showed "M," a PRESFR remark was still generated. The logic has been corrected.

- ALG **Multiple Sensor Algorithms** - Meteorological discontinuity and backup algorithms replaced the early warning and areal algorithms.
- ALG **Synoptic Maximum/Minimum Temperatures and 4 Group** - The calculation of the daily maximum and minimum temperatures has been simplified. A 4 group for 24-hour calendar day maximum and minimum temperatures has also been added to the SAO remarks.

IMPORTANT

Assuming an hourly report transmit time of HH:55 the following is true: The 1 and 2 groups, which give 6 hourly maximum and minimum temperatures (00, 06, 12, 18 UTC), and the 4 group, taken at 23:55 LST, all have a minor problem. Since these groups (1, 2, 4) of additive data are taken up to 55 minutes after the hour at the time of observation, and the temperature in the SAO/METAR observation are taken up to 56 minutes after the hour, a problem sometimes occurs. If the maximum temperature is found at 56 minutes after the hour, the observed temperature will indicate that temperature. The maximum temperature group will indicate the greatest temperature up to minute 55, which will be lower.

- ALG **Tower Visibility Remark** - No tower visibility remark is included in the SAO when both tower and surface visibility are the same.
- OBS **Invalid Temp Data Format on Monthly Summary** - Observers were able to enter only integer values for the temperature departure from normal on the monthly summary page. Observers can now enter data to the nearest tenth of a degree.
- OBS **Expand Present Weather Field for Volcanic Ash** - The first line of the present weather field has been increased to 15 characters to allow entry of "VOLCANIC ASH."
- OBS **Daily Summary Access/Edit** - The observer can now edit daily/monthly summaries even when a technician or system manager is signed on.
- OBS **Variable Visibility Remarks** - The observer was unable to delete automated variable visibility remarks from the SAO, even though these remarks could be deleted from the EDIT-REM screen. In addition, there were inconsistencies between automated visibility remarks on the OID and in the voiced remarks. Both of these problems have been fixed.
- SYS **SHEF Addresses** - Separate AFOS addresses have been added for the 15-minute criteria and 1-hour routine SHEF messages.
- SYSCH **Required CRs and LFs Not in SAO Text** - WMO specifies that an SAO text line cannot exceed 69 characters with a double carriage return/line feed. ASOS now conforms with the WMO specification.

- SYSCH **AOMC Display Page - Inaccurate Data/Time in the Download Column** - The time was inaccurate on the REVUE-SITE-VERSN-AOMC page after a download from AOMC. ASOS now downloads the SITE-PHYSICAL page first from AOMC. This corrects inaccurate data.
- SYSCH **Improper Removal of TNO Remark** - The TNO remark was being removed whenever communication was established with GS-200 or ADAS. The TNO continues to appear when ADAS or GS-200 communication is established.
- SYSCH **Rework Voicing of TNO, ZRNO, PWINO** - New voicing is:
- TNO - "Thunderstorm information not available"
ZRNO - "Freezing rain information not available"
PWINO - "Present weather information not available"
- SYSCH **SHEF Formatting** - The onset/termination criteria have been added to the 15-min SHEF message.
- SYSCH **SHEF Formatting** - Missing data will be formatted with "M" rather than "MMM," which was used in previous ASOS versions.
- SYSCH **SHEF Backup Dial Around** -
- If AFOS Hardwire port is primary - If a valid response to the reply request is not received, a single additional attempt is made via AFOS phone.
- If AFOS Phone is primary - Retry attempts are identical to those for SAOs.
- ASOSs with a hardwire connection to AFOS will now be able to transmit SHEF messages on the dial backup port without ACK/NAK protocol.
- SYSCH **Queued SHEF Messages** - If there are two SHEF messages of the same type in the ASOS-to-AFOS message queue, the most recent message is transmitted and the older message is archived with a FIBI.
- SYSCH **Major Rework of Voice Broadcast** - There is now greater use of phrases rather than single words. Vocabulary has been increased.
- SYSCH **AFOS Port Sharing Device (PSD)** - A PSD at ASOS sites can be used to communicate with AFOS using a Remote Terminal to AFOS (RTA) and Auxiliary Backup Terminal (ABT).
- SYSCH **UPS Replacement** - The SOLA UPS is no longer in production and is being replaced by a DELTEC UPS.

- SYSCH **Part-Time Station Observer Logoff** - ASOS was logging observers off during their shift at part-time stations. Additional checks were included to address opening/closing times for part-time stations.
- SYSCH **HDLC Communications Protocol Anomaly/Errors** - The HDLC protocol software used for ADAS/GS-200 communications had minor problems in error recovery logic. The logic has been corrected.
- TEC **Spontaneous Warm Boots** - SMI has written software to flag all VME BUS errors in the code, so that they can pinpoint where warm boots are occurring. The VME BUS error will tell the SMI programmers the last line of code that was executed before the warm boot occurred. SMI hopes that this will help isolate the problem. **This is not intended to solve the warm boot problem (these OTRs are still considered open); it is intended to acquire information to help them solve the problem.**
- TEC **Pressure Sensor Status Deficiency** - The ACU Status screen reported Pressure "*" (indeterminate) while REVUE-SENSOR-STATUS reported "P" (pass). Both screens now report "**"
- TEC **20% Comms Fails Not Reported On 2nd Day** - When sites experienced ACU/DCP Comms Fails >20% of the time for 2 days. The SYSLOG reported failures only on the first day. SYSLOG now reports COMMS failures at 0600 LST each day.
- TEC **AOMC Secondary Phone Number** - This adds a secondary phone number for AOMC on the REVUE-SITE-COMMS-EXTRL page, so ASOS sites have more than one phone number to dial AOMC for software uploads/downloads.
- TEC **External Communications Page** - AFOS site IDs are now displayed with the AFOS dial backup phone numbers.
- TEC **Remote Pressure Sensor Capability** - Pressure sensors can now be configured at the DCP.
- TEC **Dial Backup for Alaska and Hawaii** - Backup is provided via AFOS phone (port 1) for dial backup to the PRIME computer when the link between ASOS and ADAS/GS-200 has been lost (if there have been no ADAS/GS-200 communications for six minutes).
- TEC **Addition of Digits for ASOS-to-AOMC Phone Numbers** - Additional digits have been added to accommodate auxiliary telephone systems at remote ASOS sites.
- TEC **1200-Baud Flag for Alaska-AOMC Comms** - An editable flag is provided within the AOMC phone numbers to set the AOMC phone link to 1200 baud when Alaska sites dial AOMC.

TEC **GTA Radios** - The maintenance screen now displays: transmit frequency, power level, power supply status, forward and reflected voltages, and ACU communications. The frequency and power level can be set from the OID (by the electronics technician or system manager).

WS HQ USE ONLY		WS FORM A-26 (4/94) <small>Supersedes WS Form A-23 and WS Form H-28, which are obsolete</small>				U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE		Document Number G 4 9 9 7 8							
ENGINEERING MANAGEMENT REPORTING SYSTEM		MAINTENANCE RECORD													
General Information		1. Open Date 09 / 14 / 95		Time 0900		2. Initials MRB		3. Response Priority (check one) <input type="radio"/> Immediate <input type="radio"/> Low <input type="radio"/> Routine <input checked="" type="radio"/> Not Applicable		4. Close Date 09 / 14 / 95		Time 1000			
5. Description ACU MODIFICATION I.A.W. MOD NOTE 31															
Equipment Information		6. Station ID PWM		7. Equipment Code AACU		8. Serial Number 000179		9. TM M		10. AT M		11. How Mal. 999			
12. EQUIPMENT OPERATIONAL STATUS TIMES		a. Fully Operational <div style="border: 1px solid black; height: 20px; width: 80px;"></div>		b. Logistics Delay <div style="border: 1px solid black; height: 20px; width: 80px;"></div>		Partly Operational		c. All Other <div style="border: 1px solid black; height: 20px; width: 80px;"></div>		d. Logistics Delay <div style="border: 1px solid black; height: 20px; width: 80px;"></div>		Not Operational		e. All Other <div style="border: 1px solid black; height: 20px; width: 80px; text-align: center;">01:00</div>	
13. Parts Failure Information										14. Work Load Information					
Block #	a. ASN	b. ASN	c. TM	d. AT	e. How Mal.	f. Qty.	g. Maint. Hrs.	Type	Staff Hrs.						
1								a. Routine							
2								b. Non-routine							
3								c. Travel							
4								d. Misc.	001:00						
5								e. Overtime							
Miscellaneous Information		15. Maintenance Comments INSTALLED ACU MEMORY FIRMWARE 2.3 AND CPU FIRMWARE 1.81								16. Initials MRB					
17. SPECIAL PURPOSE REPORTING		a. Mod. No. 31		b. Mod./Act./Deact. Date 09/14/95		c.		d.		e.					
18. CONFIGURATION MGMT. REPORTING (use as directed)		a. Block #		b. Manufacturer's Part No. of New Part						c. Revision No. of New Part					

D1

Appendix D

SITES REQUIRING VERSION.2.3

This firmware is reserved for National Weather Service sites ONLY. FAA expansion sites will continue to use firmware version 2.2. The following sites are commissioned NWS sites that require the installation of firmware version 2.3. Sites soon to be commissioned also require version 2.3. OKC does not get version 2.3.

Eastern Region

ILG	WILMINGTON	DE	CAK	AKRON	OH
			CLE	CLEVELAND	OH
ORH	WORCESTER	MA	DAY	DAYTON	OH
			MFD	MANSFIELD	OH
PWM	PORTLAND	ME	TOL	TOLEDO	OH
			YNG	YOUNGSTOWN	OH
GSO	GREENSBORO	NC			
HSE	HATTERAS	NC	ABE	ALLENTOWN	PA
ILM	WILMINGTON	NC	ERI	ERIE	PA
RDU	RALEIGH/DURHAM	NC	IPT	WILLIAMSPORT	PA
			PHL	PHILADELPHIA	PA
ACY	ATLANTIC CITY	NJ			
			PVD	PROVIDENCE	RI
ALB	ALBANY	NY			
BGM	BINGHAMTON	NY	CAE	COLUMBIA	SC
BUF	BUFFALO	NY	CHS	CHARLESTON	SC
NYC	CENTRAL PARK	NY			
SYR	SYRACUSE	NY	RIC	RICHMOND	VA
			BTV	BURLINGTON	VT
			BKW	BECKLEY	WV
			CRW	CHARLESTON	WV

Southern Region

HSV	HUNTSVILLE	AL	PBI	WEST PALM BEACH	FL
MGM	MONTGOMERY	AL	TPA	TAMPA	FL
MOB	MOBILE	AL			
			AHN	ATHENS	GA
F S M	FORT SMITH	AR	ATL	ATLANTA	GA
			CSG	COLUMBUS	GA
DAB	DAYTONA BEACH	FL	AGS	AUGUSTA	GA

MCN	MACON	GA	ACT	WACO	TX
			AMA	AMARILLO	TX
BTR	BATON ROUGE	LA	AUS	AUSTIN	TX
LCH	LAKE CHARLES	LA	BPT	BEAUMONT	TX
SHV	SHREVEPORT	LA	BRO	BROWNSVILLE	TX
			CRP	CORPUS CHRISTI	TX
JAN	JACKSON	MS	DFW	DALLAS / FT WORTH	TX
MEI	MERIDIAN	MS	ELP	EL PASO	TX
TUP	TUPELO	MS	LBB	LUBBOCK	TX
			SAT	SAN ANTONIO	TX
TUL	TULSA	OK	SJT	SAN ANGELO	TX
			SPS	WICHITA FALLS	TX
CHA	CHATTANOOGA	TN	VCT	VICTORIA	TX
TRI	BRISTOL	TN			
TYS	KNOXVILLE	TN			

Central Region

ALS	ALAMOSA	CO	SUX	SIOUX CITY	IA
COS	COLORADO SPRINGS	CO			
DEN	DENVER	CO	DTW	DETROIT	MI
LIC	LIMON	CO	FNT	FLINT	MI
PUB	PUEBLO	CO	GRR	GRAND RAPIDS	MI
MLI	MOLINE	IL	STC	ST CLOUD	MN
ORD	CHICAGO	IL			
PIA	PEORIA	IL	COU	COLUMBIA	MO
RFD	ROCKFORD	IL	MCI	KANSAS CITY	MO
SPI	SPRINGFIELD	IL	SGF	SPRINGFIELD	MO
E W	EVANSVILLE	IN	FAR	FARGO	ND
IND	INDIANAPOLIS	IN			
			BFF	SCOTTSBLUFF	NE
CNK	CONCORDIA	KS	GRI	GRAND ISLAND	NE
DDC	DODGE CITY	KS	LBF	NORTH PLATTE	NE
GLD	GOODLAND	KS	LNK	LINCOLN	NE
ICT	WICHITA	KS	VTN	VALENTINE	NE
TOP	TOPEKA	KS			
			ABR	ABERDEEN	SD
CVG	COVINGTON	KY	RAP	RAPID CITY	SD
JKL	JACKSON	KY			
PAH	PADUCAH	KY	MKE	MILWAUKEE	WI
SDF	LOUISVILLE	KY			
			CYS	CHEYENNE	WY
DBQ	D U B U Q U E	IA	RIW	RIVERTON	WY
DSM	DES MOINES	IA			

Western Region

FLG	FLAGSTAFF	AZ	ELY	ELY	NV
IGM	KINGMAN	AZ	LAS	LAS VEGAS	NV
INW	WINSLOW	AZ	RNO	RENO	NV
PHX	PHOENIX	AZ	WMC	WINNEMUCA	NV
TUS	TUSCON	AZ			
BIH	BISHOP	CA	AST	ASTORIA	OR
BLU	EMIGRANT GAP	CA	BNO	BURNS	OR
FAT	FRESNO	CA	EUG	EUGENE	OR
RBL	RED BLUFF	CA	PDT	PENDLETON	OR
			PDX	PORTLAND	OR
			SLE	SALEM	OR
BOI	BOISE	ID	SXT	SEXTON SUMMIT	OR
LWS	LEWISTON	ID			
BIL	BILLINGS	M T	GEG	SPOKANE	WA
FCA	KALISPELL	M T	OLM	OLYMPIA	WA
GGW	GLASGOW	M T	SMP	STAMPEDE PASS	WA
GTF	GREAT FALLS	M T			
HLN	HELENA	M T			
HVR	HAVRE	M T			

Errata to ACU Memory Firmware Version 2.3 and ACU CPU Firmware 1.81.
Reference Modification Note 31, EHB-11, Section 3.6

GENERAL

A date problem in the World Meteorological Organization header has been identified in ACU firmware Version 2.3. The local date, instead of the Greenwich mean time date, is inserted when a corrected observation is generated. This problem may have operational impacts and technicians must get authorization from their regional office prior to installing modification notes 31 and 32.

This errata sheet provides additional information for Modification Note 31. Two additional problems have been identified with the new ACU firmware version 2.3. First, the OID display screen loses the bottom line of the display box and second, pressure sensor data quality errors occur after the firmware is installed. After ACU firmware 2.3 is installed, complete the following procedures. Setup the OID to add another screen line, and deconfigure and reconfigure the pressure sensors.

Several copies of the ACU CPU firmware version 1.81 EPROMS have been found to be bad. Technicians should check all uninstalled firmware copies of ACU CPU version 1.81.

PROCEDURES

Follow this procedure to correct the bottom line on all display screens.

1. Enter the Setup mode by pressing **F3** (ASCII keyboard)
2. Use the right arrow to select the **Screen** setup menu.
3. Select **Screen data lines** from the pull down menu.
4. Use the space bar to increment from 24 to 25 lines.
5. Use the left arrow to exit.
6. Select **Exit setup and save**. Press Enter and "Y"
7. On the keyboard numeric pad enter zero twice.
8. This completes the terminal setup.

Follow this procedure after installing ACU firmware 2.3.

1. First install the ACU firmware 2.3 as described in Modification Note 31.
2. After the installation of ACU firmware 2.3, deconfigure and reconfigure all pressure sensors. Reference the ASOS Site Technical Manual, Chapter 8, Table 8.55, entitled "Clearing Pressure Sensor Data Quality Failures."
3. This completes the deconfiguration and reconfiguration for the pressure sensors.
4. This procedure must be completed after total loss of system power.

ASOS MODIFICATION NOTE 32 (for Electronics Technicians)

Engineering Division

W/OS0321:AJW

SUBJECT Software Version 3.0 for Voice Processor Board 1A2A20

PURPOSE	To add Meteorological Aviation Report (METAR) vocabulary to ASOS.
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EQUIPMENT : ASOS Acquisition Control Unit (AACU)
AFFECTED

PARTS REQUIRED :

Microcircuit	P/N	62828-45010-1
Microcircuit	P/N	62828-45011-1
Microcircuit	P/N	62828-45012-1
Microcircuit	P/N	62828-45013-1
Microcircuit	P/N	62828-45014-1
Microcircuit	P/N	62828-45015-1
Microcircuit	P/N	62828-45016-1
Microcircuit	P/N	62828-45017-1

MOD PROCUREMENT: The above parts are available through NLSC. Technicians should order one set of voice EPROMS, S100-1A2A20-U11A for each site listed in Appendix D. Return old EPROMS to NRC.

SPECIAL TOOLS : IC insertion tool
REQUIRED Small flat-tipped screwdriver
 Conductive foam
 Electrostatic discharge (ESD) straps

TIME REQUIRED : 1 hour

EFFECT ON OTHER : INSTRUCTIONS	EHB-11, Section 3.6, Modification Note 31 must be installed in conjunction with this modification. This Modification Note supersedes Modification Note 14, and Modification Note 20.
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AUTHORIZATION : This modification is authorized by ECP E95SM05F142.

VERIFICATION : This modification has been tested for operational integrity
STATEMENT at the sites listed in Appendix B and the Engineering Design
Branch laboratory.

GENERAL

This modification note provides instructions to upgrade the ASOS voice firmware by removing and replacing erasable programmable read only memory (EPROM) microcircuits. Before installing Modification Note 32, reference EHB-11, section 3.6, ASOS Modification Note 31.

PROCEDURE

The instructions for Engineering Modification 32 describes the installation of EPROMs U11, U12, U13, U14, U31, U32, U33, and U34 on the voice processor board 1A2A20.

BEFORE INSTALLING FIRMWARE

1. Call the AOMC at 1-800-242-8194 and provide notification on which ASOS you will be installing new firmware. Confirm that the AOMC will provide access to the site-specific data base. Coordinate with the AOMC so the data base is available. Upload the current configuration before installing the new firmware.
2. Get approval of the responsible MIC/OIC before starting installation. You may install on any day of the month if restrictions in steps 3 and 4 are satisfied.
3. Commissioned Sites Only: Do not start installation during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of these conditions are expected within 3 hours. The responsible MIC/OIC will define these meteorological conditions.
4. Do not start firmware installation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Although about 45 minutes should be sufficient, allow one hour to complete installation and restart ASOS.
5. Immediately before beginning work at NWS staffed sites, the MIC/OIC/ Observer will inform the tower and any other critical users that ASOS will be shut off for firmware upgrade. At an unstaffed site, the el tech will inform the tower using Controller Video Displays (CVD) and Operator Interface Devices (OID) to log off and shut down display power to avoid confusion. Commissioned sites only, are to download the following data to the laptop using the direct command mode: 5-minute data (12 hrs.), SYSLOG information (24 hrs.), SHEF messages (24 hrs.), and any 2-hour archive files.
6. Do not begin the installation process, i.e., halt ASOS, until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.
7. Disable all hardwire and dial communication ports to AFOS (REVUE-SITE-CONFIG-COMMS). Go into the AOMC page (REVUE-SITE-VERSN-AOMC); wait for the external communication and the site physical lines to change from "AUTO UPLOAD REQ" to "COMPLETE" before going to the next step. The system voice function will automatically broadcast a "not available" message when the ACU power is turned off.

8. Make the appropriate SYSLOG entries (MAINT-ACT-FMK) Mod 32:
 1. Log on as **TECH**.
 2. Key the **MAINT** screen.
 3. Key the **ACT** page.
 4. Key **START** - Stop here and preform Mod 32.
Upon completion of the Mod 32, log onto the system.
9. Continue with Appendix A, Instructions for ACU voice processor board firmware version upgrade. Once the steps in Appendix A have been completed, continue with "After Installing Firmware," step 10.

AFTER INSTALLING FIRMWARE

See step 12, page 4 for a description of the time required to reboot ASOS and sensor response time after a new firmware load.

10. When ASOS is restarted at unstaffed sites, call to inform towers using CVDs and OIDs to turn on their displays. (At staffed sites, the MIC/OIC/Observer will call the tower.)
11. If on-site NWS staff provides backup while the installation is underway, no special observation is needed when ASOS is restarted. Proceed to step 12.

If there is no backup at a site and a record observation was missed during the installation, a special observation must be taken when ASOS is restarted. The el tech should take the following steps at the ASOS keyboard after installation:

1. Press [SIGN].
2. Type his/her initials and press [RETURN].
3. Type the observer level password and press [RETURN].
4. Press [GENOB].
5. Press [SPECL].
6. Press [EXIT].
7. Press [SIGN].
8. Type his/her initials again and press [RETURN].
9. Press [RETURN] twice. This signs the "observer" off ASOS.
10. Leave ASOS running.

Note: The "observer" must sign off before the 5-minute edit time is up.

12. Inform the office staff that ASOS is again operational. If less than 25 minutes remain until the next hourly observation, augmentation of the ceiling may be required. It might also be necessary to augment several elements or even the entire observation. The chart below indicates how long it takes after a start up for ASOS to report each observation element automatically.

Times Needed for Elements to be Reported Automatically

	<u>Minimum</u>	<u>Maximum</u>
Pressure	60seconds	10 minutes
Precipitation Amount	60seconds	*
Winddirection	2 minutes	7 minutes
Windspeed	2 minutes	7 minutes
Precipitation Type	2 minutes	*
Temperature	5 minutes	10 minutes
Dew Point	5 minutes	10 minutes
Visibility	10 minutes	15 minutes
Obstruction to Visibility	10 minutes	*
Ceiling	30 minutes	35 minutes

* Maximum time not applicable since phenomena may not be present. Minimum time applies if phenomena are present.

13. Verify that ASOS transmitted an hourly observation. Call the AOMC at 1-800-242-8194 and tell the operator:
 1. Your location.
 2. That installation of the new firmware has been completed.
 3. That ASOS is operational.

14. Enter in the SYSLOG that maintenance has been completed.
 1. Key the **MAINT** screen.
 2. Key the **ACT** page.
 3. Key **FMK** - Enter the Field Mod Kit (FMK) number as follows: Mod 32
 On the second line of the screen verify that only Mod 32 is displayed. Complete by entering Y in the Y/N if only Mod 32 is displayed. If Mod 31 was completed, make appropriate log entries.
 4. Check the SYSLOG and verify the FMK message. Notify the AOMC via telephone that Mod 32 and any other Mods that have been completed.

15. At an expansion site with ATCT, the el tech will contact the ATCT and supply information on the following:
 1. ASOS maintenance is completed.
 2. ASOS is restored to service.
 3. Tower CVDs and OIDs need to be turned on, and TRACON displays need to be turned on.

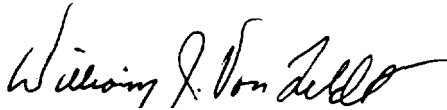
REPORTING MODIFICATION

Target date for completion of this modification is 30 days after receipt of parts. Report completed modification on a Weather Service Form A-26 maintenance record, per instructions in EHB-4, Part 2, Appendix F, using reporting code AACU. If this modification is installed in conjunction with Modification Note 31, a separate Weather Service Form A-26 must be completed for each modification note.

Also, record the modification number in block 17(a) as 32 (see appendix C for a completed sample of WS Form A-26).

NOTE:

Parts removed (EPROMs) should be returned to NRC as S100-FMK015D.OLD. NRC will be reprogramming the EPROMs for other ASOS applications.



Acting Chief Engineering Division

Appendix A
Appendix B
Appendix C
Appendix D

APPENDIX A

INSTRUCTIONS FIELD MODIFICATION KIT - ACU VOICE PROCESSOR BOARD FIRMWARE VERSION UPGRADE

1. UPGRADING ACU VOICE PROCESSOR BOARD FIRMWARE

1.1 GENERAL

Digital voice processing consists of three operations: producing a verbal report based on current ASOS data from a stored vocabulary, recording an operator-generated addendum up to 90 seconds long, and producing an output consisting of the automatically generated data and the operator input. Outputs are available for the FAA handset, dial-up reports, and FAA radio communications for aircraft. Voice processing is accomplished with two dedicated boards: a Voice Processor board and a Voice Recorder/Playback board. The Voice Processor board contains the CPU for the digital voice system. It receives digital voice files from the ASOS CPU, creates voice reports consistent with the data reported by the sensors, and receives operator-generated digitized audio from the Voice Recorder/Playback board. The Voice Recorder/Playback board receives digitized voice from the Voice Processor board and converts the data into audio. Audio is output for dial-in weather requests, for the FAA handset at OID port 5C, and to an FAA transmitter for pilot use. In addition, the Voice Recorder/Playback board receives input voice audio from the FAA handset, digitizes the input audio, and transfers the digitized audio to the Voice Processor board for storage in random access memory (RAM).

1.2 FIRMWARE UPGRADE PROCEDURE

The procedure to upgrade the ACU voice firmware by removing and replacing the eight EPROMs on the Voice Processor board is followed. See Figure 1.

REMOVAL

Step

1. Set OUTPUT POWER switch on UPS status panel to 0 (**OFF**) position. Output indicator on status panel extinguishes.

CAUTION

Damage to equipment may result if power is not removed prior to removal or installation. Ensure that OUTPUT POWER switch is set to 0 (OFF) position and that facility power is removed.

To avoid damage to circuit boards, use proper electrostatic discharge (ESD) handling procedures, including the use of a grounding strap, when performing the following steps.

2. Remove facility power from ACU cabinet.
3. Using ASOS Site Maintenance Manual, locate circuit board to be removed.
4. When removing Voice Processor Board 1A2A20, disconnect cable from front of board by exerting outward force on cable release tabs at top and bottom of connector.
5. Using small flat-tipped screwdriver, loosen captive screws at top and bottom of board.
6. If board is equipped with extractor handles, press handles in opposite directions to release board. If board does not have extractor handles, gently rock board while exerting outward pressure and remove board from rack.

CAUTION

Throughout this procedure, discharge screwdriver before and during use by touching tool to grounded chassis surface. Failure to comply may result in damage to integrated circuits.

Lift integrated circuit as evenly as possible. Failure to comply may result in damage to integrated circuits.

7. From the front of board, slide small flat-tipped screwdriver between integrated circuit U11 and its IC socket. Carefully pry up on U11 to lift it from socket as evenly as possible. Remove U11 from socket and place in conductive foam or on another static-free surface.
8. Repeat step 7 for integrated circuits U12, U13, U14, U31, U32, U33, and U34.

INSTALLATION

Step

1. Verify that OUTPUT POWER switch on UPS status panel is set to 0 (OFF) position and OUTPUT indicator on status panel is extinguished.

CAUTION

Damage to equipment may result if power is not removed prior to removal or installation. Ensure that OUTPUT POWER switch is set to 0 (OFF) position and facility power is removed.

To avoid damage to circuit boards, use proper ESD handling procedures, including the use of a ground strap, when performing the following steps.

2. Verify that facility power is removed from ACU cabinet.

CAUTION

Throughout this procedure, discharge IC insertion tool before and during use by touching tool to grounded chassis surface. Failure to comply may result in damage to integrated circuits.

3. Using IC insertion tool, remove new EPROM integrated circuits from protective packaging and insert into Voice Processor board IC sockets in accordance with the following chart. Ensure that EPROMs are installed with pin 1 (as identified by notch in top of IC) oriented toward top of Voice Processor board as shown on Figure 1.

<u>IC socket</u>	<u>IC Part number</u>
U11	62828-45010-1
U12	62828-45011-1
U13	62828-45012-1
U14	62828-45013-1
U31	62828-45014-1
U32	62828-45015-1
U33	62828-45016-1
U34	62828-45017-1

4. Holding board by handles, position board with component side to right and carefully slide board into card rack on its guides. Align board with rear connector and press into place.

Using small flat-tipped screwdriver, tighten captive screws at top and bottom of board.

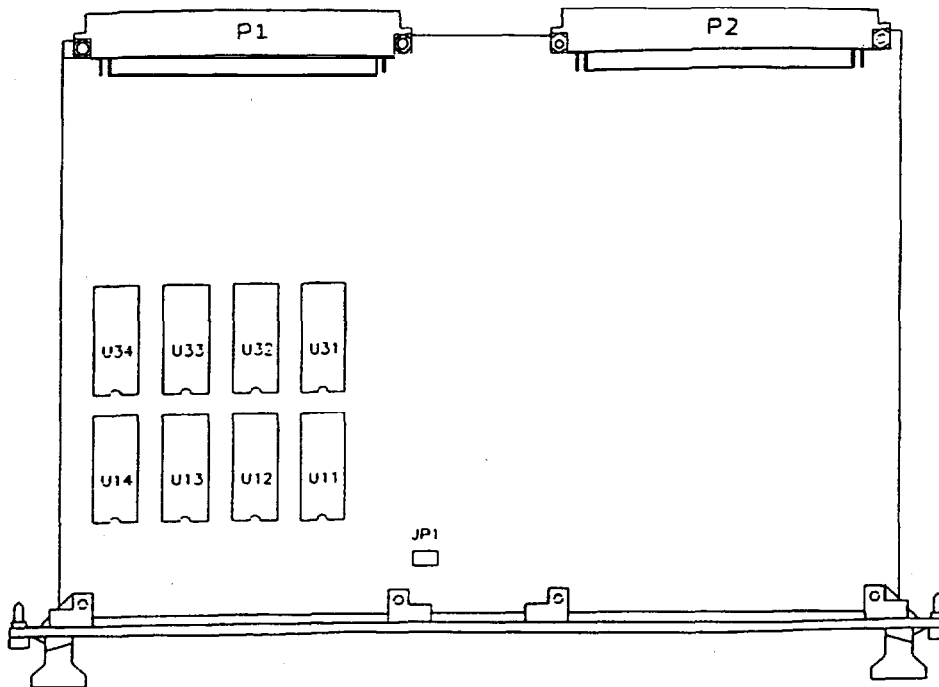
Using small flat-tipped screwdriver, tighten captive screws at top and bottom of board.

When installing Voice Processor board 1A2A20, connect cable attached to the front of board as follows:

- a. Position connector extraction tabs to their fully extended position.
 - b. Locate cable keys and position keys to right; install cable in connector.
5. This completes Modification Note 32. Modification Note 31 must be completed in conjunction with this note before going to step 6.
 6. Apply facility power to ACU cabinet.
 7. Set OUTPUT POWER switch to 1 **(ON)** position.

This completes the installation.

FIGURE1



VOICE PROCESSOR BOARD 1A2A20

ASSY 62828-47018-10

ALL COMPONENTS NOT SHOWN

<u>IC socket</u>	<u>IC Dart number</u>
U11	62828-45010-1
U12	62828-45011-1
U13	62828-45012-1
U14	62828-45013-1
U31	62828-45014-1
U32	62828-45015-1
U33	62828-45016-1
U34	62828-45017-1

The test sites for version 3.0 are:

NWS Eastern Region

BOS - Boston Logan, MA
CON - Concord, NH
PWM - Portland, ME
TAN - Taunton, MA

NWS Southern Region

AHN -Athens, GA
3R5 - New Braunfels, TX

NWS Central Region

BIS - Bismarck, ND
GTJ - Grand Junction, CO
LBF - North Platte, NE
STP - St. Paul, MN

NWS Western Region

BNO - Burns, OR

NWS Alaska Region

ANC - Anchorage, AK

WS HQ USE ONLY		WS FORM A-26 (4/94) <small>Supersedes WS Form A-23 and WS Form H-28, which are obsolete</small>					U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE		Document Number G 4 9 9 7 8				
ENGINEERING MANAGEMENT REPORTING SYSTEM MAINTENANCE RECORD													
General Information		1. Open Date 09 / 14 / 95		Time 0900		2. Initials MRB		3. Response Priority (check one) <input type="radio"/> Immediate <input type="radio"/> Low <input type="radio"/> Routine <input checked="" type="radio"/> Not Applicable		4. Close Date 09 / 14 / 95		Time 1000	
5. Description ACU MODIFICATION I.A.W. MOD NOTE 32													
Equipment Information		6. Station ID PWM		7. Equipment Code AACU		8. Serial Number 000179		9. TM M		10. AT M		11. How Mal. 999	
1 2. EQUIPMENT OPERATIONAL STATUS TIMES		a. Fully Operational <div style="border: 1px solid black; height: 20px; width: 80px;"></div>		b. Logistics Delay <div style="border: 1px solid black; height: 20px; width: 80px;"></div>		Partly Operational		c. All Other <div style="border: 1px solid black; height: 20px; width: 80px;"></div>		d. Logistics Delay <div style="border: 1px solid black; height: 20px; width: 80px;"></div>		Not Operational	
												e. All Other <div style="border: 1px solid black; padding: 2px;">01:00</div>	
13. Parts Failure Information												14. Work Load Information	
Block #	a. ASN	b. NSN	c. TM	d. AT	e. How Mal.	f. Qty.	g. Maint. Hrs.	Type	Staff Hrs.				
1								a. Routine					
2								b. Non-routine					
3								c. Travel					
4								d. Misc.	001:00				
5								e. Overtime					
Miscellaneous Information		15. Maintenance Comments INSTALLED SOFTWARE VERSION 3.0 FOR VOICE PROCESSOR BOARD 1A2A20								16. Initials MRB			
17. SPECIAL PURPOSE REPORTING		a. Mod. No. 32		b. Mod./Act./Deact. Date 09/14/95		c.		d.		e.			
18. CONFIGURATION MGMT. REPORTING (use as directed)		a. Block #		b. Manufacturer's Part No. of New Part						c. Revision No. of New Part			

SITES REQUIRING VERSION 3.0

This firmware is reserved for National Weather Service sites ONLY. FAA expansion sites will continue to use firmware version 2.0. The following sites are commissioned NWS sites that require the installation of firmware version 3.0. Sites soon to be commissioned also require version 3.0.

Eastern Region

ILG	WILMINGTON	DE	CAK	AKRON	OH
			CLE	CLEVELAND	OH
ORH	WORCESTER	MA	DAY	DAYTON	OH
			MFD	MANSFIELD	OH
PWM	PORTLAND	ME	TOL	TOLEDO	OH
			YNG	YOUNGSTOWN	OH
GSO	GREENSBORO	NC			
HSE	HATTERAS	NC	ABE	ALLENTOWN	PA
ILM	WILMINGTON	NC	ERI	ERIE	PA
RDU	RALEIGH/DURHAM	NC	IPT	WILLIAMSPORT	PA
			PHL	PHILADELPHIA	PA
ACY	ATLANTIC CITY	NJ			
			PVD	PROVIDENCE	RI
ALB	ALBANY	NY			
BGM	BINGHAMTON	NY	CAE	COLUMBIA	SC
BUF	BUFFALO	NY	CHS	CHARLESTON	SC
NYC	CENTRAL PARK	NY			
SYR	SYRACUSE	NY	RIC	RICHMOND	VA
			BTV	BURLINGTON	VT
			BKW	BECKLEY	WV
			CRW	CHARLESTON	WV

Southern Region

HSV	HUNTSVILLE	AL	PBI	WEST PALM BEACH	FL
MGM	MONTGOMERY	AL	TPA	TAMPA	FL
MOB	MOBILE	AL			
			AHN	ATHENS	GA
FSM	FORT SMITH	AR	ATL	ATLANTA	GA
			CSG	COLUMBUS	GA
DAB	DAYTONA BEACH	FL	AGS	AUGUSTA	GA

MCN	MACON	GA	ACT	WACO	TX
			AMA	AMARILLO	TX
BTR	BATON ROUGE	LA	AUS	AUSTIN	TX
LCH	LAKE CHARLES	LA	BPT	BEAUMONT	TX
SHV	SHREVEPORT	IA	BRO	BROWNSVILLE	TX
			CRP	CORPUS CHRISTI	TX
JAN	JACKSON	MS	DFW	DALLAS / FT WORTH	TX
MEI	MERIDIAN	MS	ELP	EL PASO	TX
TUP	TUPELO	MS	LBB	LUBBOCK	TX
			SAT	SAN ANTONIO	TX
TUL	TULSA	OK	SJT	SAN ANGELO	TX
			SPS	WICHITA FALLS	TX
CHA	CHATTANOOGA	TN	VCT	VICTORIA	TX
TRI	BRISTOL	TN			
TYS	KNOXVILLE	TN			

Central Region

ALS	ALAMOSA	CO	SUX	SIOUX CITY	IA
COS	COLORADO SPRINGS	CO			
DEN	DENVER	CO	DTW	DETROIT	MI
LIC	LIMON	CO	FNT	FLINT	MI
PUB	PUEBLO	CO	GRR	GRAND RAPIDS	MI
MLI	MOLINE	IL	STC	ST CLOUD	MN
ORD	CHICAGO	IL			
PIA	PEORIA	IL	COU	COLUMBIA	MO
RFD	ROCKFORD	IL	MCI	KANSAS CITY	MO
SPI	SPRINGFIELD	IL	SGF	SPRINGFIELD	MO
E W	EVANSVILLE	IN	FAR	FARGO	ND
IND	INDIANAPOLIS	IN			
			BFF	SCOTTSBLUFF	NE
CNK	CONCORDIA	KS	GRI	GRAND ISLAND	NE
DDC	DODGE CITY	KS	LBF	NORTH PLATTE	NE
GLD	GOODLAND	KS	LNK	LINCOLN	NE
ICT	WICHITA	KS	VTN	VALENTINE	NE
TOP	TOPEKA	KS			
			ABR	ABERDEEN	SD
CVG	COVINGTON	KY	RAP	RAPID CITY	SD
JKL	JACKSON	KY			
PAH	PADUCAH	KY	MKE	MILWAUKEE	WI
SDF	LOUISVILLE	KY			
			CYS	CHEYENNE	WY
DBQ	DUBUQUE	IA	RIW	RIVERTON	WY
DSM	DES MOINES	IA			

Western Region

FLG	FLAGSTAFF	AZ	ELY	ELY	NV
IGM	KINGMAN	AZ	LAS	LAS VEGAS	NV
INW	WINSLOW	AZ	RNO	RENO	NV
PHX	PHOENIX	AZ	WMC	WINNEMUCA	NV
TUS	TUSCON	AZ			
			AST	ASTORIA	OR
BIH	BISHOP	CA	BNO	BURNS	OR
BLU	EMIGRANT GAP	CA	EUG	EUGENE	OR
FAT	FRESNO	CA	PDT	PENDLETON	OR
RBL	RED BLUFF	CA	PDX	PORTLAND	OR
			SLE	SALEM	OR
			SXT	SEXTON SUMMIT	OR
BOI	BOISE	ID			
LWS	LEWISTON	ID	GEG	SPOKANE	WA
			OLM	OLYMPIA	WA
BIL	BILLINGS	MT	SMP	STAMPEDE PASS	WA
FCA	KALISPELL	MT			
GGW	GLASGOW	MT			
GTF	GREAT FALLS	MT			
HLN	HELENA	MT			
HVR	HAVRE	MT			

ASOS MODIFICATION NOTE 33 (for Electronics Technicians)

Engineering Division

W/OSO321:BGM/AJW

SUBJECT ACU Memory Firmware Version 2.4 and ACU CPU Firmware 1.81

PURPOSE Firmware for Meteorological Aviation Report (METAR).

EQUIPMENT : ASOS Acquisition Control Unit (AACU)
AFFECTED

PARTS REQUIRED : CPU Microcircuit P/N 62828-45000
CPU Microcircuit PIN 62828-45001
ACU Memory Microcircuit P/N 62828-45002-1
ACU Memory Microcircuit P/N 62828-45003-1
ACU Memory Microcircuit P/N 62828-45004-1
ACU Memory Microcircuit PIN 62828-45005-1
RAM Chips P/N 62828-900361 (4 ea.)
Label, ACU Memory Card
Stuffing Chart Label, ACU

MOD PROCUREMENT: The above parts are available through NLSC and are required at all commissioned sites. Appendix B and E identifies those sites requiring this modification before June 28, 1996. Technicians should order one set of CPU EPROMs, S100-1A2A1-U29 for each ACU CPU when upgrading to 1.81 (two sets per system). One set of ACU memory EPROMs, S100-1A2A3-U8B must be ordered for each site. Sites with ACU firmware version 2.2 or lower must order one S100-FMK059 (ACU memory upgrade) for each site. Return old EPROMs to NRC.

SPECIAL TOOLS : IC insertion tool
REQUIRED Small flat blade screwdriver
Conductive foam
Electrostatic discharge (ESD) straps

TIME REQUIRED : 1 hour. Additional time is required to incorporate other modifications.

EFFECT ON OTHER : EHB-11, section 3.6, Modification Note 32 (Voice 3.0) must be
INSTRUCTIONS installed in conjunction with this modification. This modification note supersedes Modification Note 20, including errata, Modification Note 31 and Modification 14. Remove Modification Note 29 (Installation of 3K ohm resistor on wind sensor), if installed, before starting this modification.

AUTHORIZATION : This modification is authorized by ECPs E96-SM05F164.

VERIFICATION : This modification has been tested for operational integrity at the
sites
STATEMENT listed in Appendix B and the Engineering Design Branch laboratory.

GENERAL

This modification note provides procedures to upgrade the ASOS software by removing and replacing erasable programmable read only memory (EPROM) and adding random access memory (RAM). This note provides procedures for "Before Installing Firmware" and "After Installing Firmware." Appendix C contains information on changes and corrections implemented in firmware version 2.4. Before installing Modification Note 33, reference EHB-11, section 3.6, ASOS Modification Notes 32. The voice processor firmware, Modification Note 32, is required to be installed in conjunction with this modification.

PROCEDURE

The following installation instructions are for EPROMs U8, U7, U17, and U21, RAM chips U46, U47, U52, U53 on the ACU memory board 1A2A3. Installation instructions are also for EPROMs U29 and U30 on the ACU CPU boards 1A2A1 and 1A2A2 when upgrading to version 1.81. The instructions also includes placement information for the ACU stuffing chart label and the ACU memory board part number label.

CAUTION

Be careful to protect the electronics on the ACU memory and CPU boards during this procedure. Do not reconfigure any jumpers on the ACU memory or the ACU CPU boards unless instructed to do so by the procedure.

BEFORE INSTALLING FIRMWARE

1. Call the AOMC at 1-800-242-8194 and provide notification on which ASOS you will be installing new firmware. Confirm that the AOMC will provide access to the site-specific data base. Coordinate with the AOMC that the data base is available. Upload the current configuration before installing the new firmware. Go into the AOMC page (REVUE-SITE-VERSN-AOMC); wait for the external communication and the site physical lines to change from "UPLOAD REQ" to "COMPLETE" before going to the next step.
2. Get approval of the responsible MIC/OIC before starting installation. You may install on any day of the month if restrictions in steps 3 and 4 are satisfied.
3. Commissioned Sites Only: Do not start installation during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of these conditions are expected within 3 hours. The responsible MIC/OIC will define these meteorological conditions.
4. Do not start firmware installation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Although about 45 minutes should be sufficient, allow 1 hour to complete installation and restart ASOS.
5. Immediately before beginning work at NWS staffed sites, the MIC/OIC/ Observer will inform the tower and any other critical users that ASOS will be shut off for firmware upgrade. At an

unstaffed site, the el tech will inform the tower using Controller Video Displays (CVD) and Operator Interface Devices (OID) to log off and shut down display power to avoid confusion. **Commissioned sites only are to download the following data to the laptop using the direct command mode: 5-minute data (12 hrs.), SYSLOG information (24 hrs.), SHEF messages (24 hrs.), and any P-hour archive files. Forward collected data to the responsible DAPM.**

6. Do not begin the installation process, i.e., halt ASOS, until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.
7. Disable all hardwire and dial communication ports to AFOS (REVUE-SITE-CONFIG-COMMS). Go into the AOMC page (REVUE-SITE-VERSN-AOMC); wait for the external communication and the site physical lines to change from 'AUTOUPLOAD REQ' to "COMPLETE" before going to the next step. The system voice function will automatically broadcast a "not available" message when the ACU power is turned off.
8. Make the appropriate SYSLOG entries (MAINT-ACT-FMK) Mod 33
 1. Log on as **TECH**.
 2. Key the **MAINT** screen.
 3. Key the **ACT** page.
 4. Key **START** - Stop here and perform Mod 33.
Upon completion of the Mod 33, log onto the system.
9. Mod Note 32 is required to be installed with this modification. Continue with Appendix A, Instructions for ASOS Software Version Upgrade. Once the steps in Appendix A have been completed, continue with "After Installing Firmware," step 10.

AFTER INSTALLING FIRMWARE

See page 4 for a description of the time required to reboot ASOS and sensor response time after a new firmware load.

10. When ASOS is restarted at unstaffed sites, call to inform towers using CVDs and OIDs to turn on their displays. (At staffed sites, the MIC/OIC observer will call the tower.)
11. If on-site NWS staff provides backup while the installation is underway, no special observation is needed when ASOS is restarted. Proceed to step 12.

If there is no backup at a site and a record observation was missed during the installation, a special observation must be taken when ASOS is restarted. The el tech should take the following steps at the ASOS keyboard after installation:

1. Press [SIGN].
2. Type his/her initials and press [RETURN].
3. Type the observer level password and press [RETURN].
4. Press [GENOB].
5. Press [SPECL].
6. Press [EXIT].
7. Press [SIGN].
8. Type his/her initials again and press [RETURN].

9. Press [RETURN] twice. This signs the "observer" off ASOS.
10. Leave ASOS running.

Note: The "observer" must sign off before the 5-minute edit time is up.

12. Inform the office staff that ASOS is again operational. If less than 25 minutes remain until the next hourly observation, augmentation of the ceiling may be required. It may be necessary to augment several elements or even the entire observation. The chart below indicates how long it takes after a startup for ASOS to report each observation element automatically.

Times Needed for Elements to be Reported Automatically

	<u>Minimum</u>	<u>Maximum</u>
Pressure.....	60 seconds	10 minutes
Precipitation Amount	60 seconds	*
Wind direction	2 minutes	7 minutes
Wind speed	2 minutes	7 minutes
Precipitation Type	2 minutes	*
Temperature	5 minutes	10 minutes
Dew Point	5 minutes	10 minutes
Visibility	10 minutes	15 minutes
Obstruction to Visibility	10 minutes	*
Ceiling	30 minutes	35 minutes

* Maximum time not applicable since phenomena may not be present. Minimum time applies if phenomena are present.

13. Verify that ASOS transmitted an hourly observation. Call the AOMC at 1-800-242-8194 and tell the operator:
 1. Your location;
 2. That installation of the new firmware has been completed;
 3. That ASOS is operational.
14. Enter in the SYSLOG that maintenance has been completed.
 1. Key the **MAINT** screen.
 2. Key the **ACT** page.
 3. Key **FMK** - Enter the Field Mod Kit (FMK) number as follows: Mod 33.
On the second line of the screen verify that only Mod 33 is displayed. Complete by entering Y in the Y/N if only Mod 33 is displayed. If mods 33 and 32 were completed, make appropriate log entries.
 4. Check the SYSLOG and verify the FMK message. Enter a comment in the SYSLOG stating that version 2.4 has been installed. Notify the AOMC via telephone that Mod 33, version 2.4 and any other Mods have been completed.
15. At an expansion site with ATCT, the el tech will contact the ATCT and supply information on the following:
 1. ASOS maintenance is completed.
 2. ASOS is restored to service.
 3. Tower CVDs and OIDs need to be turned on, and TRACON displays need to be turned on.

Reporting Modification

Target date for completion of this modification is **prior to June 28, 1996**. Target date for other sites is 30 days after receipt of parts. Report completed modification on a Weather Service Form A-26 maintenance record, per instructions in EHB-4, Part 2, Appendix F, using reporting code AACU. **Add in the comment field that version 2.4 was installed.** If this modification is installed in conjunction with Modification Note 32, a separate Weather Service Form A-26 must be completed for each modification note.

Also, record the modification number in block 17 (A) as 33 (see Appendix D for a completed sample of WS Form A-26).

NOTE:

Parts removed (EPROMs) should be property packed and returned to NRC as S100-FMK015D.OLD. NRC will be reprogramming the EPROMs for other ASOS applications.



Acting Chief, Engineering Division

Appendix A
Appendix B
Appendix C
Appendix D
Appendix E

INSTRUCTIONS

FIELD MODIFICATION KIT - ASOS SOFTWARE VERSION UPGRADE

1. UPGRADING ASOS SOFTWARE

1.1 GENERAL

All ASOS application software is contained on the four erasable programmable read only memory (EPROM) integrated circuits (IC) on ACU memory board 1A2A3. Figure 1 illustrates the ACU memory board and identifies the four EPROMs (U8, U17, U7, and U21). The EPROMs are 32-pin dual in-line package (DIP) CMOS devices, each providing 512Kx8 bits of storage. Upgrading ASOS software requires only replacing the four EPROMs on the ACU memory board with higher revision level ICs.

Figure 1 also identifies the four additional RAM chips (U46, U47, U52 and U53). The RAM chips are 32-pin DIP CMOS devices, each providing 128K x 8 bits of storage. There will be no jumpers or switch setting changes to the board. **One RAM chip is added to the top of the clock socket/chip (U52). This causes the chip to protrude into the next card slot position.**

The four EPROMs on the ACU memory board contain both the ACU application program and the DCP application program. The ACU CPU runs the ACU application program directly from the ACU memory board. The DCP application program must first be downloaded from the ACU memory board to RAM storage in the DCP before it can be run by the DCP CPU,

All ASOS operating software is contained on two EPROM ICs on each ACU CPU board 1A2A1 and 1A2A2. Figure 2 illustrates the ACU CPU board and identifies the two EPROMs (U29 and U30). The EPROMs are 28-pin DIP CMOS devices, each providing 256K x 8 bits of storage. Upgrading pSOS ASOS software requires only replacing the two EPROMs on each ACU CPU board with higher revision level ICs.

Sites without a local OID (i.e., no RS232 connected for the primary OID) should attach a terminal to the primary OID port of the ACU 1A9J22 before proceeding.

1.2 SOFTWARE UPGRADE PROCEDURE

This procedure provides instructions to upgrade ASOS software by removing and replacing the four EPROMs and adding four RAM chips on the ACU memory board. This procedure also provides instructions to upgrade two EPROMs on each of the ACU CPU boards to version 1.81. After new EPROMs are installed, this procedure cold starts both the ACU and associated DCPs.

If the ACU EPROMs in the system are 1.70 or higher, the ACU is no longer cold started by removing battery jumper J22 (Figure 1) to clear all RAM on the board. The next step requires receiving a download of site-specific data from the AOMC. The DCPs are cold started by performing a hard reset of each DCP from the processor status page on the OID. After completion of the upgrade procedure, the EPROMs removed from the ACU memory board should be packaged in appropriate electrostatic discharge (ESD) protective material for return to NRC.

NOTE:

There may be an approximate 20-minute wait required to access the AOMC.

Step

1. If the printer is on-line, place it off-line by pressing the ON-LINE switch located on the printer front panel.

CAUTION

Damage to equipment may result if power is not removed prior to removal or installation. Ensure that OUTPUT POWER switch is set to 0 (OFF) and facility power is removed.

To avoid damage to circuit boards and integrated circuits, use proper ESD handling procedures, including using a grounding strap when performing the following steps.

2. Set OUTPUT POWER switch on UPS status panel to the 0 (OFF) position. The indicator for the OUTPUT status panel extinguishes. (This step is only required on systems with a UPS).
3. Remove facility AC power from ACU cabinet.
4. Using a small flat blade screwdriver, loosen the captive screws located at top and bottom of ACU memory board 1A2A3. If ACU CPU firmware has not been upgraded to version 1.81, loosen captive screws located at top and bottom of the ACU CPU boards 1A2A1 and 1A2A2.
5. Press extractor handles at top and bottom of ACU CPU boards 1A2A1, 1A2A2 if required and ACU memory board 1A2A3 in opposite directions to release board. Remove board from rack.
6. On the underside of the ACU memory board, using a flat blade screwdriver, remove three screws and flat washers securing front panel to board. Remove board from front panel.
7. If the ACU memory EPROMs in the system are 1.70 or higher proceed to step 8, otherwise continue with step 7. Remove battery jumper J22 from ACU memory card. The jumper will be reinstalled during the installation procedure.

CAUTION

Throughout this procedure, discharge the screwdriver before and during use by touching tool to the grounded chassis surface. Failure to comply may result in damage to the integrated circuits.

8. From the front of the board, slide small flat blade screwdriver between integrated circuit U7 and its IC socket. Carefully lift up on U7 to remove it from the socket as evenly as possible. After U7 is removed from the socket, place in a conductive foam or on some other static-free surface.
9. Repeat Step 8 for removal of the following integrated circuits U8, U17 and U21.
10. If required, remove U29 and U30 from the ACU CPU printed circuit boards 1A2A1 and 1A2A2 sockets and place the removed integrated circuits in a conductive foam or on some other static-free surface.

CAUTION

The ACU memory board has a battery that keeps voltage on the RAM sockets. **DO NOT** use a metal insertion tool when installing the RAM ICs. Avoid shorting out the voltage and ground pins. Shorting out the voltage pin will corrupt any stored data and is similar to performing a cold boot.

11. Using the IC insertion tool, remove the new EPROM ICs from protective packaging and insert them into the ACU memory board sockets in accordance with the following chart. Ensure that the EPROMs are installed with pin 1 (as identified by notch in top of IC) oriented toward board connector P1 and P2 as shown on Figure 1.

<u>IC socket</u>	<u>IC part number</u>
U8	62828-45002-1
U17	62828-45003-1
U7	62828-45004-1
U21	62828-45005-1

12. Step 12 and 13 can be skipped if ACU memory version 2.23 or later has been installed. Using the IC insertion tool, remove the RAM ICs from protective packaging and insert them into the ACU memory board sockets U46, U47, U52 and U53. Ensure that the RAMs are installed with pin 1 (as identified by notch in top of IC) oriented toward board connector P1 and P2 as shown on Figure 1. U52 already has a clock chip installed. **DO NOT REMOVE THE CLOCK CHIP.** Install the RAM chip on top of the clock chip.
13. Remove the part number label (ASSY 62828-47008-10) from the ACU memory card and install the new label (ASSY 62828-47008-20) in the same location.
14. Use a small flat blade screwdriver, and install the three flat washers and screws. This will secure the front panel to the board.
15. With the RAM chip stacked on top of the clock chip, the RAM chip protrudes into the next card slot. Remove the board or blank panel in VME slot 1A2A4.

16. Hold the ACU memory board by handles, position the board with the component side facing to the right and carefully slide board into VME slot 1A2A3. Align the board with the rear connector and press into place. Reinstall the 1A2A4 board or blank panel.
17. Use a small flat blade screwdriver and tighten the captive screws located at top and bottom of boards and blank panels.
18. If required, remove the new EPROM ICs from the protective packaging. Use an IC insertion tool to insert the EPROMs into the ACU CPU board's sockets (1A2A1 and 1A2A2) in accordance with the following chart. Ensure that all the EPROMs are installed with pin 1 (as identified by notch in top of IC) oriented toward the top of the ACU CPU board as shown on Figure 2.

<u>IC socket</u>	<u>IC part number</u>
U29	62828-45000-1
U30	62828-45001-1

19. If required, hold the ACU CPU board by the handles, position the board with the component side facing to the right and carefully slide board into the card rack on its guides. Align the board with the rear connector and press into place.
20. If required, use a small flat blade screwdriver, and tighten the captive screws located at the top and bottom of the ACU CPU board.
21. Install the stuffing chart label directly over the stuffing chart located on the inside of ACU back door. Center the stuffing chart label over the ACU memory board section of the chart.
22. This completes Modification Note 33. If the voice firmware is 2.0 or lower, complete Modification Note 32 before going to step 23.
23. Apply facility power to ACU cabinet. Set OUTPUT POWER switch to 1 (ON) position. (This step is not required for systems that do not have a UPS).
24. After the power is applied to the ACU, one of the PASS (Green) LEDs on the CPU should illuminate and the PASS LED on the other CPU will remain off. After approximately 1 minute, the LED that was off should start blinking.
25. Place the line printer on-line by pressing the ON-LINE switch located on the printer front panel. The ON-LINE indicator illuminates.
26. With the power applied to the ACU and OID and after a brief warmup delay, the OID displays 1-minute data. If the display is not being updated, press the HELP key twice to refresh screen. The NEED SID AND AOMC PHONE message appears at top of screen. If this does not occur, return to REMOVAL procedure, step 1. Follow the steps until the ACU memory board is removed. Ensure the ACU memory EPROMs are installed correctly. Follow the INSTALLATION procedures to replace the ACU memory board.
27. At the OID, sign onto system as a "Technician." Note: Passwords are reset to the default values.

28. Display the external communications page on the OID (sequentially press REVUE-SITE-CO-NFG-EXTRN keys from 1-minute display). Enter both AOMC phone numbers (1-800-253-4717 & 1-800-434-1133) into the AOMC PHONE NUMBER field and press the EXIT function key.
29. Display the site physical page on the OID (sequentially press REVUE-SITE-PHYS function keys from 1-minute display). Enter the three or four character SID code in the STATION IDENTIFIER field and press the EXIT function key. The system then calls the AOMC and receives a download of site-specific data.
30. Display the AOMC version page on the OID (sequentially press REVUE-SITE-VERSN-AOMC function keys from 1-minute display). This will allow you to observe that all the files are being downloaded from the AOMC. All status fields should read "COMPLETE" in approximately 5 minutes. Press EXIT.

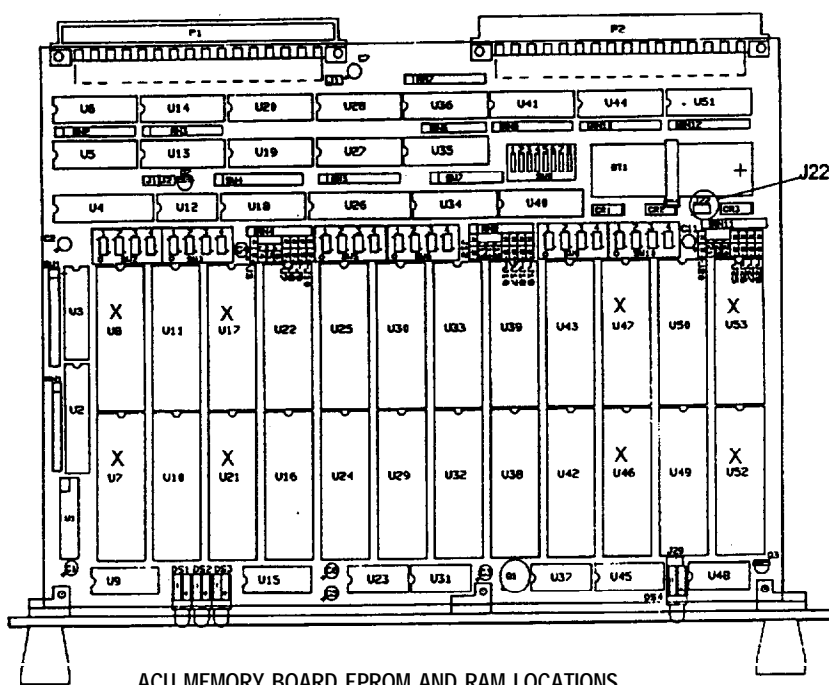
NOTE: The following steps cold start the DCPs.

31. Display the maintenance page on the OID (press the MAINT function key from 1-minute display).
32. Use the PREV/NEXT keys, position the cursor over PROC field and press the SEL key. The OID displays the processor status page.
33. Use the PREV/NEXT keys, position the cursor over DCP #1 - HARD field and press the RESET key. Respond "YES" and "ENTER" to the "ARE YOU SURE?" message. The corresponding status field displays INITIALIZING while the unit is initializing. The progress of the download can be monitored by the PERCENT COMPLETE message that appears at the top of the screen. When the percent complete reaches 100, the DCP status field changes to RUNNING in a single DCP configuration..
34. If the system contains more than one DCP, repeat step 31 through 33 for DCPs #2 and #3 as required. Once all the DCPs have been downloaded 100 percent, the DCP status field will change to RUNNING.

FINAL ACTIONS

1. After the Mod has been completed, clear any maintenance flags that occur as a result of the restart.
2. Display the SW version page on the OID (sequentially press REVUE-SITE-VERSN-SW function keys from 1-minute display). The following fields should display version 2.4: MEMORY ACU APPLICATION EPROM, MEMORY DCP APPLICATION EPROM, and MEMORY DCP APPLICATION RAM. PSOS field should display "CPU A PSOS OS EPROM 1.81" and "CPU B PSOS OS EPROM 1.81" (These fields may take 5-10 minutes before they all read 2.4.)
3. When upgrading from ACU firmware 2.2 or later this step is not required. EI Techs should enter site identifications for each AFOS dial backup telephone number. SHEF addresses must be entered on the external communications page. Specific addresses can be obtained from the local MIC/OIC. AFOS backup block and the AOMC 1200 baud fields should be N, for all sites in the CONUS.
4. ***With the installation of firmware 2.4, the freezing rain sensor must be configured if installed in accordance with the ASOS site technical manual S100, chapter 1, paragraph 1.3.10.3, table 1.3.2.1.***
5. Sites with GTA radios should be configured in accordance with the ASOS site technical manual S100, chapter 12, paragraph 12.4.5.1.
6. Sites with multiple DCPs must change the second and third DCP locations to include "RWY" for runway designator. Go to (REVUE-SITE-CONFIG-SENSR-ALGOR-CHANG) and modify the location field. Actual runway values (i.e., 110, 140, etc.) should be obtained from site survey and verified with the systems manager.
7. Upload site configuration to the AOMC. Go into the AOMC page (REVUE-SITE-VERSN-AOMC) wait for all the lines to change from "UPLOAD REQ" to "COMPLETE."

ASSEMBLY DRAWING



ACU MEMORY BOARD EPROM AND RAM LOCATIONS

FIGURE 1

EPROM
U 7
U 8
U17
U21

RAM
U46
U47
U52
U53

Figure 2 is a schematic diagram of a CPU board layout. The board is rectangular with a power supply connector (P1) at the top. Various components are labeled: EPROM U29 and U30 are at the bottom left; JK1 is a connector at the bottom center; J1, J2, J3, J4, J5, J6, J7, J8, J9, J10, J11, J12, J13, J14, J15, J16, J17, J18, J19, J20 are various connectors; A, B, C, D are labels for specific connector pins. The board is labeled "CPU BOARD" at the bottom.

The test sites for version 2.4 are:

ANC	ANCHORAGE	- T \
LBF	NORTH PLATTE	- S \C
STP	ST PAUL	- T \TBC
BIS	BISMARCK	- T \TBC
FAR	FARGO	- T \C
EVV	EVANSVILLE	- T \C
IND	INDIANAPOLIS	- T \TBC
CON	CONCORD	- S \
FVE	FRENCHVILLE	-S\C M
HSE	HATTERAS	- S\C
OFP	RICHMOND	- S\C
RIC	RICHMOND	- T \C
OKC	OKLAHOMA CITY	- T \C
AHN	ATHENS	- S \C
FSM	FORT SMITH	- T \C
T R I	BRISTOL/JOHNSON/KINGSPORT	- T \C
TYS	KNOXVILLE	- T \C
CHA	CHATTANOOGA	- T \C
3R5	NEW BRAUNFELS	- S \TBC
AST	ASTORIA	- S \C
SLC	SALT LAKE CITY	- H
SFO	SAN FRANCISCO	- H \TBC
ABQ	ALBUQUERQUE	- T \TBC
TAN	TAUNTON	- S \
GLD	GOODLAND	- S \C
HLC	HILL CITY	- S \TBC
MKE	MILWAUKEE	- H \C
MIA	MIAMI	- H \TBC

Operational Trouble Reports (OTR) Fixed in V2.4

This appendix is a subsection of the Software release note published by the Field Systems Branch, OSO13. The software release note describing the detail changes to ASOS software version 2.4 is available from Frank Lucadamo, 301-713-0386, ext.186, and should be read by all technicians. Electronic distributions are also available.

Other changes which affect the electronics technician are described below.

New Algorithms

ITEM	TITLE/COMMENTS	PROBLEM	SOLUTION
1	Snow Intensity modification	Snow intensity from LEDWI was not modified by the visibility in ASOS.	Snow intensity from the LEDWI is now modified correctly for visibilities less than 1 mile.
2	Invalid peak wind remark	An invalid peak wind remark was generated in SAO Mode: PK WND MM35/1902. A missing direction and valid wind speed should not be encoded together.	When a missing wind direction or missing win&speed is encountered, the peak wind remark is not generated.

Other Changes

System Changes

A minor change in format is found in the 1-minute OID screen. Station pressure, pressure altitude, and density altitude no longer have a blank line separating them. This is highlighted in the following example where output from version 2.4 is compared to version 2.3.

21:14:37 01/26/96 0214Z

SILVER SPRING METRO CENTER 2

SKY = OVCO19		
VISIBILITY = 10SM	TWR = M1/4SM	TEMP/DEWPT = 3.3 / 1.1 C 38 / 34 F
* PRESENT WX =	WIND DIR/SPD = 110/11	ALTIMETER = 30.33
REMARKS = RMK A02 SFC VIS 10 PNO		
SPECI 270212Z 11012KT 2SM OVCO19 03/01 A3034 RMK A02 SFC VIS 10 PNO \$		
MAG WIND DIR/SPD: 120/11		
RELATIVE HUMIDITY: 85	STATION PRESSURE: 29.88	PRINT GENOB CMD
SEA LVL PRESSURE: 1042.1	PRESSURE ALTITUDE 150	REVUE TWR
	DENSITY ALTITUDE: 1100	SIGN EDIT A U X

Note: Observer's 1-minute screen software version 2.40.

15:26:24 02/29/96 2026Z

SILVER SPRING METRO CENTER 2

SKY =MM		
VISIBILITY = 10+	TEMP/DEWPT = 0.6 / -12.8 C 34 / 09 F	
PRESENT WX = S-	WIND DIR/SPD = 000/00	
	ALTIMETER = 30.06	
REMARKS =		
SP1 SP 2024 AO2A MM 5S- M/34/09/0000/007/ PCPN 0000		
HAG WIND DIR/SPD: 000/00		
RELATIVE HUMIDITY: 36	STATION PRESSURE: 29.59	PRINT GENOB CMD
SEA LVL. PRESSURE: M	PRESSURE ALTITUDE: -30	REVUE TM
	DENSITY ALTITUDE: -1600	SIGN EDIT AUX

Note: Software Version 2.30.

The rest of the system changes are found in the table below.

ITEM	TITLE/COMMENTS	PROBLEM	SOLUTION
1	Printer paper conservation	Printer paper was being wasted when the user-requested prints were generated. A form feed was inserted after every user-requested print.	The extra form feed after the user-requested print has been removed. The amount of paper wasted will be minimized.
2	Invalid COR in AFOS message header.	This problem appeared in version 2.30 for some ASOS to ASOS sites with remote connectivity via dial-in, PACE, peripheral sharing device, or remote dial around for hardwired connection.	The AFOS header only contains "COR" under the appropriate circumstances.
3	METAR time and date activation.	METAR implementation date changed to July 1, 1996 at 0800 UTC.	Changed to July 1, 1996 at 0800 UTC.
4	When COR is issued, the WMO Header contains an incorrect date between 0000 UTC and midnight LST.	The ASOS/AFOS interface incorrectly assigns an LST date and UTC time for the effected period. The date should be in UTC.	ASOS firmware was modified to convert LST date and time to UTC date and time.
5	Wrong year reported in 5-minute observation	After a warm boot, the system year was initialized as "1992" until the AOMC was accessed to synchronize the clock.	The correct date now appears on the 5-minute observations after a warm boot.
6	Warm start problems occurred with: A: UTC dates B: Remote DAILY command.	A: Remote terminal login using direct command mode (DCM) and UTC times causes a warm reboot. B: For software version 2.3 warmstarts occurred when DAILY information was requested from a remote terminal.	A: Problem was fixed by having the firmware correctly converts the UTC date/time to LST. B: Fixed by having the firmware check the appropriate file.

Changes that Affect the System Manager

With the exception of the changes in the site physical characteristics page, the following table contains the software modification that affects the system manager (SYS) password level.

ITEM	TITLE/COMMENTS	PROBLEM	SOLUTION
1.	Runway designation modifications	New METAR FMH requirements specify the abbreviation for runway as "RWY."	ASOS now allows both "RY" and "RWY" as runway designators.

ITEM	TITLE/COMMENTS	PROBLEM	SOLUTION
3	EDIT-EXIT printout does not reflect the data entered by the observer	Edited temperature, visibility, and sky values entered by the observer were not reflected correctly on the EDIT-EXIT entry printout.	Edited temperature, visibilities, and sky values are now correctly reflected on the EDIT-EXIT printout.
4	Modify COR processing	The observer needs the ability to ABORT the corrected observation "COR" process.	An ABORT function is now provided in the CMD-OBS-COR menu.

Changes that Affect the Air Traffic Controller

ITEM	TITLE/COMMENTS	PROBLEM	SOLUTION
1	Special SAO/SPECI for hail and changes in freezing rain intensity	Required special SAO/SPECI were not generated for hail and changes in freezing rain intensity.	Requirements were added to generate a special SAO/SPECI for begin/end of hail and changes in freezing rain intensity.
2	Incorrect auto remarks	Surface and tower visibility remarks were not being displayed on the EDIT REM screen.	Surface and tower visibility remarks are now being displayed.

Changes that Affect Electronics Technicians

ITEM	TITLE/COMMENTS	PROBLEM	SOLUTION
1.	Pressure missing after cold start.	For version 2.3 software, pressure data is missing after a cold start of ASOS. (Pressure sensor 1 failed and pressure 3 appears to be in a comms waiting state.)	Fixed by adjusting the initialization process during the cold start.
2	Runway designation modifications	New METAR FMH requirements specify the abbreviation for runway as "RWY"	ASOS now allows both "RY" and "RWY" as runway designators.

Changes that Affect Unsigned Users

The following are changes that affect unsigned users (UNS).

ITEM	TITLE/COMMENTS	PROBLEM	S O L U T I O N
1	Warm start problems occurred with: A: UTC dates B: Remote DAILY command.	A: Remote terminal login using (DCM) and UTC times causes a warm reboot. B: For software version 2.3 warmstarts occurred when DAILY information was requested from a remote terminal.	A: Problem was fixed by having the firmware correctly converts the UTC date/time to LST. B: Fixed by having the firmware check the appropriate file.

WS HQ USE ONLY		WS FORM A-26 (4/94) <small>Supersedes WS Form A-23 and WS Form H-28, which are obsolete</small>				U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE				Document Number G 49978	
General Information		1. Open Date		Time	2. Initials		3. Response Priority (check one)			4. Close Date	
		03/ 29 / 96		0900	MRB		<input type="radio"/> Immediate <input type="radio"/> Low <input type="radio"/> Routine <input checked="" type="radio"/> Not Applicable			03 / 29 / 96 1000	
5. Description											
ACU MODIFICATION I.A.W. MOD NOTE 33											
Equipment Information		6. Station ID		7. Equipment Code		8. Serial Number		9. TM		10. AT	
		COS		AACU		000012		M		M	
12. EQUIPMENT OPERATIONAL STATUS TIMES		a. Fully Operational		b. Logistics Delay		Partly Operational		c. All Other		d. Logistics Delay	
										Not Operational	
										e. All Other	
										01:00	
13. Parts Failure Information										14. Work Load Information	
Block #	a. ASN	b. NSN	c. TM	d. AT	e. How Mal.	f. Qty.	g. Maint. Hrs.	Type	Staff Hrs.		
1								a. Routine			
2								b. Non-routine			
3								c. Travel			
4								d. Misc.	001:00		
5								e. Overtime			
Miscellaneous Information		15. Maintenance Comments								16. Initials	
		INSTALLED ACU MEMORY FIRMWARE VERSION 2.4 AND CPU FIRMWARE 1.81								MRB	
17. SPECIAL PURPOSE REPORTING		a. Mod. No.	b. Mod./Act./Deact. Date	c.	d.	e.					
		33	03/29/96								
18. CONFIGURATION MGMT. REPORTING (use as directed)		a. Block #	b. Manufacturer's Part No. of New Part						c. Revision No. of New Part		

APPENDIX E

ALASKA REGION

	S I D	LOCATION	
1	A21	Portage Glacier	AK
2	ADQ	Kodiak	A K
3	AKN	King Salmon	A K
4	ANC	Anchorage	A K
5	ANN	Annette	A K
6	B I G	Delta Junction	A K
7	BRW	Barrow	A K
8	CDB	Cold Bay	A K
9	ENA	Kenai	A K
10	ENN	Nenana	A K
11	F A I	Fairbanks	A K
12	HOM	Homer	A K
13	JNU	Juneau	A K
14	K T N	Ketchikan	A K
15	M C G	McGrath	A K
16	PAQ	Palmer	A K
17	SGY	Skagway	AK
18	S I T	Sitka	AK
19	SOV	Seldovia	AK
20	SWD	Seward	A K
21	TKA	Talkeetna	AK

EASTERN REGION

	S I D	LOCATION	
1	ABE	Allentown	PA
2	ACY	Atlantic City	NJ
3	AFN	Jaffrey	NH
4	ALB	Albany	NY
5	AQW	North Adams	MA
6	AVL	Asheville	NC
7	AVP	Wilkesbarre	PA
8	BDL	Windsor Locks	CT
9	BDR	Bridgeport	CT
10	BGM	Binghamton	NY
11	BKW	Beckley	WV
12	BML	Berlin	NH
13	BOS	Boston	MA
14	BTV	Burlington	VT
15	BUF	Buffalo	NY
16	BWI	Baltimore	MD
17	CAE	Columbia	SC
18	CAK	Arkon	OH
19	CAR	Caribou	ME
20	CHS	Charleston	SC
21	CLE	Cleveland	OH
22	CLT	Charlotte	NC
23	CMH	Columbus	OH
24	CON	Concord	NH
25	CQX	Chatham	MA
26	CRW	Charleston	WV

EHB-11
 Issuance 96- 7
 5/13/96

E2

	S I D	L O C A T I O N	
27	CVG	Cincinnati	OH
28	DAY	Dayton	OH
29	DCA	Dulles WashDC	VA
30	EKN	Elkins	WV
31	ERI	Erie	NY
32	EWB	New Bedford	MA
33	EWR	Newark	NJ
34	FIT	Fitchburg	MA
35	FVE	Frenchville	ME
36	GSO	Greensboro	NC
37	GSP	Greer	SC
38	HIE	Whitefield	NH
39	HSE	Hatteris	NC
40	HTS	Huntington	WV
41	IAD	NationalWashDC	DC
42	IJD	Willimantic	CT
43	ILG	Wilmington	DE
44	ILM	Wilmington	NC
45	IPT	Williamsport	PA
46	IWI	Wisscasset	ME
47	IZG	Fryeburg	ME
48	JFK	New York	NY
49	LGA	New York	NY
50	LHQ	Lancaster	OH
51	LYH	Lynchburg	VA
52	MFD	Mansfield	OH
53	MLT	Millinocket	ME
54	MPV	Montpelier	VT

	SID	LOCATION	
55	MVL	Morrisville	V T
56	NOO	Fulton	N Y
57	NYC	N Y C Central Park	N Y
58	OFP	Richmond	V A
59	ORE	Orange	M A
60	ORF	Norfolk	V A
61	ORH	Worcester	M A
62	PHL	Philadelphia	PA
63	PIT	Pittsburgh	PA
64	PNE	Philadelphia	PA
65	PVD	Providence	RI
66	PWM	P o r t l a n d	M E
67	PYM	Plymouth	M A
68	R D U	Raleigh/Durham	NC
69	R I C	Richmond	VA
70	R O A	Roanoke	VA
7 1	R O C	Rochester	N Y
72	SYR	Syracuse	N Y
73	TAN	Taunton	M A
7 4	T E B	Teterboro	N J
75	T O L	T o l e d o	O H
76	UUU	Newport	R I
77	VSF	Springfield	VT
78	WAL	Wallops Island	VA
79	YNG	Youngstown	OH

SOUTHERN REGION

	SID	LOCATION	
1	3R5	New Braunfels	TX
2	ABI	Abilene	TX
3	ABQ	Albuquerque	NM
4	ACT	Waco	TX
5	AGS	Augusta	GA
6	AHN	Athens	GA
7	AMA	Amarillo	TX
8	ATL	Atlanta	GA
9	AUS	Austin	TX
10	BGD	Borger	TX
11	BKV	Brooksville	FL
12	BNA	Nashville	TN
13	BPT	Beaumont	TX
14	BRO	Brownsville	TX
15	BTR	Baton Rouge	LA
16	CHA	Chattanooga	TN
17	CRP	Corpus Christi	TX
18	CSG	Columbus	GA
19	DAB	Daytona Beach	FL
20	DFW	Dallas/Fort Worth	TX
21	DNL	Augusta	GA
22	DRT	Del Rio	TX
23	DTO	Denton	TX
24	ELP	El Paso	TX

	S I D	L O C A T I O N	
25	ESF	Alexandria	LA
26	EYW	Key West	FL
27	FFC	Atlanta	GA
28	FSM	fORT sMITH	AR
29	FST	Fort Stockton	TX
30	GIF	Winter Haven	FL
31	GVL	Gainesville	GA
32	HDO	Hondo	TX
33	HSV	Huntsville	AL
34	IAH	Houston	TX
35	JAN	Jackson	MS
36	JAX	Jacksonville	FL
37	LBB	Lubbock	TX
38	LCH	Lake Charles	LA
39	LEE	Leesburg	FL
40	MAF	Midland	TX
41	M CN	M a c o n	GA
42	MCO	Orlando	FL
43	MEI	Meridian	MS
44	M G M	Montgomery	AL
45	MIA	Miami	FL
46	MKL	Jackson	MO
47	M K O	Muskogee	OK
48	MLC	McAlester	OK
49	MOB	Mobile	AL
50	MSY	New Orleans	LA
51	OKC	Oklahoma City	OK

	SID	LOCATION	
52	PBI	West PalmBeach	FL
53	PGD	Punta Gorda	FL
54	PWA	Oklahoma	OK
55	RKP	Rockport	TX
56	SAT	San Antonio	TX
57	SAV	Savannah	GA
58	SHV	Shreveport	LA
59	SJT	San Angelo	TX
60	SJU	San JUAN	PR
61	SPS	Wichita Falls	TX
62	T27	Burnet	TX
63	TLH	Tallahassee	FL
64	TPA	Tampa	FL
65	TRI	Bristol	TN
66	TUL	Tulsa	OK
67	TUP	Tupelo	MS
68	TYS	Knoxville	TN
69	VCT	Victoria	TX
70	X41	New Port Richey	FL

CENTRAL REGION

	SID	LOCATION	
1	3KM	Wichita	KS
2	ABR	Aberdeen	SD

	SID	LOCATION	
3	AIA	Alliance	NE
4	AKO	Akron	CO
5	ALN	St. Louis	IL
6	ALO	Waterloo	IA
7	ALS	Alamosa	CO
8	AMW	Ames	IA
9	APN	Alpena	MI
10	ATY	Waterloo	SD
11	AXN	Alexandria	MN
12	BDE	Baudette	MN
13	BEH	Benton Harbor	MI
14	BFF	Scottsbluff	NE
15	BIS	Bismarck	ND
16	BMG	Bloomington	IN
17	BRD	Brainerd	IN
18	BWG	Bowling Green	KY
19	C19	Holland	MI
20	CAG	Craig	CO
21	CEZ	Cortez	CO
22	CFV	Coffeyville	KS
23	CID	Cedar Rapids	IA
24	CNK	Concordia	KS
25	CNU	Chanute	KS
26	COS	Colorado Springs	CO
27	COU	Columbia	MO
28	CPR	Casper	WY
29	CYS	Cheyenne	WY

	SID	LOCATION	
30	DBQ	Dubuque	IA
31	DDC	Dodge City	KS
32	DEN	Denver	CO
33	DLH	Duluth	M N
34	D M O	Sedalia	M O
35	D R O	Durango	CO
36	DSM	Des Moines	IA
37	DTW	Detroit	MI
38	DVN	Davenport	IA
39	E E O	Meeker	C O
40	EMP	Emporia	KS
41	EST	Estherville	IA
42	EVV	Evansville	IN
43	EYE	Indianapolis	IN
44	FAR	Fargo	N D
45	FFT	Frankfort	KY
46	FNT	Flint	MI
47	FSD	Sioux Falls	SD
48	FWA	Fort Wayne	IN
49	GCK	Garden City	K S
50	GJT	Grand Junction	C O
51	GLD	Goodland	K S
52	GLR	Gaylord	MI
53	GRB	Green Bay	WI
54	GRI	Grand Island	N E
55	GRR	Grand Rapids	MI
56	GVW	Kansas City	M O
57	HEI	Hettinger	N D

	SID	LOCATION	
58	HLC	Hill City	NE
59	HON	Huron	SD
60	HSI	Hastings	KS
61	HTL	Houghton Lakes	MI
62	HUT	Hutchinson	KS
63	HYR	Hayward	WI
64	ICT	Wichita	KS
65	IMT	Iron Mountian	WI
66	IND	Indianapolis	IN
67	INL	International Falls	MN
68	IOW	Iowa City	IA
69	ISN	Williston	ND
70	ISW	Wisconsin Rapids	WI
71	JEF	Jefferson City	MO
72	JKL	Jackson	KY
73	LAA	Lamar	CO
74	LAN	Lansing	MI
75	LBF	North Platte	NE
76	LEX	Lexington	KY
77	LHX	La Junta	CO
78	LIC	Limon	CO
79	LNK	Lincoln	NE
80	LOZ	London	KY
81	LWC	Lawrence	KS
82	MCI	Kansas City	MO
83	MCK	McCook	NE
84	MFI	Marshfield	WI

EHB-11
 Issuance 96-7
 5 / 1 3 / 9 6

SID		LOCATION	
85	MHK	Manhattan	KS
86	MKE	Milwaukee	WI
87	MKG	Muskegon	M I
88	MLI	Moline	IA
89	MSN	Madison	WI
90	M S P	Minneapolis	M N
91	MTJ	Montrose	CO
92	NED	Winner	SD
93	O F K	Norfolk	N E
94	OJC	Olathe	KS
95	OMA	Omaha	N E
96	ORD	Chic ago	I L
97	OSH	Oshkosh	WI
98	PAH	Paducah	KY
99	P I A	Peoria	IL
100	PKD	Park Rapids	M N
101	PLN	Pellston	MI
102	P P F	Parsons	KS
103	PUB	Pueblo	CO
104	PWK	Chicago/Whelings	IL
105	RAP	Rapid City	SD
106	R F D	Rockford	IL
107	R I L	Rifle	C O
108	R I W	Riverton	W Y
109	R S L	Russell	K S
110	RST	Rochester	MN
111	SBN	South Bend	IN
112	S D F	Louisville	K Y

	SID	LOCATION	
113	SGF	Springfield	M O
114	SHR	Sheridan	W Y
115	SLN	Salina	K S
116	SNY	Sidney	N E
117	SPI	Springfield	I L
118	SPW	Spenser	I A
119	STC	ST. Cloud	M N
120	STJ	S. Joseph	M O
121	STL	St. louis	M O
122	STP	St. Paul	M N
123	SUX	Souix City	I A
124	T O P	Topeka	K S
125	T Q E	Tekamah	N E
126	VTN	Valentine	N E
127	W L D	Winfield	K S

WESTERN REGION

	SID	LOCATION	
1	AST	Astoria	OR
2	BFL	Bakersfield	CA
3	BIH	Bishop	CA
4	BIL	Billings	M T
5	BLU	Emigrant Gap	CA
6	BNO	Burns	OR
7	B O I	Boise	I D
8	B Z N	B o z e m a n	M T

	SID	LOCATION	
9	DRA	Mercury	NV
10	ELY	Ely	NV
11	EUG	Eugene	OR
12	FAT	Fresno	CA
13	FCA	Kalispell	MT
14	FLG	Flagstaff	AZ
15	GCN	Grand Canyon	AZ
16	GEG	Spokane	WA
17	GGW	Glasgow	MT
18	GTF	Great Falls	MT
19	HLN	Helena	MT
20	HVR	Havre	MT
21	IGM	Kingman	AZ
22	INW	Winslow	AZ
23	LAS	Las Vegas	NV
24	LGB	Long Beach	CA
25	LWS	Lewiston	ID
26	MFR	Medford	OR
27	MHS	Mt. Shasta	CA
28	MLF	Milford	UT
29	MLP	Mullan Pass	ID
30	MSO	Missoula	MT
31	OLM	Olympia	WA
32	PDT	Pendleton	OR
33	PDX	Portland	OR
34	PGA	Page	AZ
35	PHZ	Phoenix	AZ
36	PIH	Pocatello	ID

	SID	LOCATION	
37	RBL	Red Bluff	CA
38	RNO	Reno	NV
39	SCK	Stockton	CA
40	SDB	Sandberg	CA
41	SEA	Seattle	WA
42	SFO	San Francisco	CA
43	SLC	Salt Lake City	UT
44	SLE	Salem	OR
45	SMP	Stampede Pass	WA
46	SMX	Santa Maria	CA
47	SXT	Sexton	OR
48	TUS	Tucson	AZ
49	UIL	Quillayute	WA
50	WMC	Winnemucca	NV
51	YKM	Yakima	WA

PACIFIC REGION

	SID	LOCATION	
1	HNL	Honolulu	HI

Errata to ACU Memory Firmware Version 2.4 and ACU CPU Firmware 1.81
Modification Note 33, EHB-11, Section 3.6

GENERAL

This errata sheet provides additional information for modification note 33. A problem has been identified with the installation of sites having the Controller Video Display (CVD) configured version 2.4 firmware. Technicians are directed to delete the CVDs on the site configuration page if there were no CVDs installed. Approximately 18 sites have one or more CVDs installed and approximately 220 sites have CVDs configured. With the previous versions of firmware, the 5 second wind update of the current 2 minute average wind (magnetic), the current 1 minute update of the altimeter setting, the last transmitted SAO, and the density altitude at the time of the last transmitted SAO were displayed. When version 2.4 firmware is installed, the CVD stopped displaying any information. This errata sheet provides instructions for a work around for this problem.

Errata sheet 1 provides information for configuration of sites where no freezing rain sensors are installed.

These procedures can be done remotely and are automatically uploaded to the AOMC. This work must be done by **JULY 1, 1996**. If either of these procedures are being completed in conjunction with the installation of version 2.4, the firmware must be installed first then configuration files must be downloaded from the AOMC before the procedure is started.

PROCEDURES:

A. CVD: Follow this procedure to correct the **CVD** problem.

1. Sign in as Technician. Using the keyboard numeric pad select the following:
2. Enter, **REVUE-SITE-CONFIG-COMMS**: You should **now** be in **ACU Serial Comms Page**.
3. Use Previous/Next to highlight the **CVD SIO Port** and then **SEL** the port.
Enter, **Previous/Next** to go to the **Function Field**.

IMPORTANT: Read the two conditions before proceeding with this procedure, choose either a or b and execute.

- a. If the **CVD** is in this **Function Field**, and there is no **CVD** installed sequence until a space appears in the field, then **BACK**. The **SIO Port** should be blank.
This completes the CVD procedure. Exit and sign off.
- b. If there is a **CVD** in this field and a **CVD** is installed, then press **SEQ** until **NAVY ATC** appears in the field.
EXIT. This completes the CVD procedure.

NOTE:

After the change is made, the **CVD** will only display the following message.
The altimeter is displayed every 5 seconds and updated once a minute. The magnetic wind direction and speed are updated every 5 seconds.

EXAMPLE:

30.00M23/M15

•
•
•
•

30.00M23/M15

B. Follow this procedure for **freezing rain sensor** configuration.

1. Sign in as Technician.
2. Enter, **REVUE-SITE-CONFIG-SENSOR-CHANG**
to **LOCAL SENSORS**, using the Next or Previous on the Keypad.
 - a. Deconfigure all virtual (local) freezing rain sensors, if there are no freezing rain sensor installed. The **FR** is to be changed to ******.
3. Enter **Back** and verify that **FR** has changed to ******.
4. **EXIT** and sign off.
This completes the freezing rain sensor configuration change.

EFFECT ON OTHER INSTRUCTIONS

Updates to modification note 33.

REPORT MAINTENANCE ACTION

N o n e .


Acting Chief, Engineering Division

ASOS MODIFICATION NOTE 34 (for Electronics Technicians)

Engineering Division

W/OSO321:BGM/AJW

SUBJECT : Automated Surface Observing System (ASOS)
Freezing Rain Sensor

PURPOSE Add a sensor to measure freezing rain on existing ASOS.

EQUIPMENT AFFECTED : ASOS Freezing Rain Sensor (AZR)

PARTS REQUIRED : Reference parts listed in Appendix A.

MOD PROCUREMENT : The above parts will be provided through NLSC by WSH. WSH will issue one freezing rain sensor pole kit, S100-2MT3MPI for each site listed in appendix D. There are two types of freezing rain sensor circuit breakers. WSH will issue S1002A1A3A3-1 for each site listed in appendix E. WSH will issue one freezing rain sensor, S100-2MT3, for each site listed in appendix F.

SPECIAL TOOLS
REQUIRED None

TIMEREQUIRED 4 hours

EFFECT ON OTHER
INSTRUCTIONS ASOS Modification Notes 31, ACU memory firmware version 2.3, and 32, voice processor firmware version 3.0, are to be installed in conjunction with this modification.

AUTHORIZATION This modification is authorized by
Engineering Change Proposal E92SM05F030.

VERIFICATION
STATEMENT This modification has been tested for operational integrity by the Engineering Design Branch, Sensor Test Section in Sterling, Virginia, and sites listed in appendix C.

GENERAL

This modification note provides a procedure to install the freezing rain sensor. The freezing rain sensing device consists of a small cylindrical probe which, when stimulated, vibrates at 40 kHz, its resonant frequency. When ice freezes to the probe its mass increases and the sensors resonant vibration frequency decreases. The sensor is sensitive enough to measure accumulation rates as low as 0.01 inch per hour. The firmware energizes the heater relay once every 10 hours for a maximum of 50 mSec and measures voltage drop across the series resistor in the heater circuit.

PROCEDURE:

Instructions are provided in appendix B for installation of the freezing rain sensor. Reference installation instructions for EHB-11, Section 3.6, Modification Note 31, ASOS software version 2.3 upgrade. Modification Note 31 and Modification Note 32 must be completed prior to or concurrent with this modification note.

BEFORE INSTALLING FIRMWARE

1. Call the AOMC at 1-800-242-8194. Inform the AOMC at which site you will be installing the freezing rain sensor.
2. For commissioned sites, get approval of the responsible MIC/OIC before starting installation. For non-commissioned sites, coordinate with the MIC/OIC before starting installation. You may install on any day of the month if permission is granted and the restrictions in steps 3 and 4 are complied with.
3. Commissioned Sites Only: Do not start installation during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of these conditions are expected within 3 hours. These meteorological conditions will be defined by the responsible MIC/OIC.
4. Do not start installation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Allow 4.0 hours to complete installation and restart ASOS.
5. Immediately before beginning work at NWS staffed sites, the MIC/OIC observer will inform the tower and any other critical users that ASOS will be under maintenance control while the freezing rain sensor is added (at unstaffed sites, the el tech will inform tower). Alert towers using Controller Video Displays (CVD) and Operator Interface Devices (OID) to log off and shut down display power to avoid confusion.

6. Make the appropriate SYSLOG entries (MAINT-ACT-FMK) Mod
 1. Log on as **TECH**.
 2. Key the **MAINT** screen.
 3. Key the **ACTION** page.
 4. Key **START** - Stop here and perform Mod 34.
Upon completion of the Mod 34, log onto the system.
7. Continue with appendix A, Instructions for installation of the freezing rain sensor. Once complete with the steps in appendix A, continue with "After Installing Sensor," step 8.

AFTER INSTALLING SENSOR

See page 4 for a description of the time required to reboot ASOS and sensor response time after power is applied.

8. When ASOS is restarted at unstaffed sites, call to inform towers using CVDs and OIDs to turn on their displays. (At staffed sites, the MIC/OIC/observer will call the tower.)
9. If on-site NWS staff provides backup while the installation is underway, no special observation is needed when ASOS is restarted. Proceed to step 12.

If there is no backup on site and a record observation was missed during the installation, a special observation must be taken when ASOS is restarted. The el tech should take the following steps at the ASOS keyboard after installation:

- a Press [SIGN].
- b Type initials and press [ENTER].
- c Type the observer level password and press [ENTER].
- d Press [GENOB] .
- e Press [SPECL] .
- f Press [EXIT].
- g Press [SIGN].
- h Type his/her initials again and press [RETURN].
- i Press [Enter] twice. This signs the "observer" off ASOS.
- j Leave ASOS running.

Note: The "observer" must sign off before the 5-minute edit time is up.

10. Inform office staff that ASOS is again operational and that because at most 15 minutes remain until the next hourly observation, augmentation of the ceiling might be required. Also, may be necessary to augment several elements or even manually enter an entire

observation. The chart below indicates how long it takes after start up for ASOS to automatically report each observation element.

Times Needed for Elements to be Reported Automatically

	<u>Minimum</u>	<u>Maximum</u>
Pressure	60 seconds	10 minutes
Precipitation Amount	60 seconds	*
Wind direction	2 minutes	7 minutes
Wind speed	2 minutes	7 minutes
Precipitation Type.....	2 minutes	*
Temperature	5 minutes	10 minutes
Dew Point	5 minutes	10 minutes
Visibility	10 minutes	15 minutes
Obstruction to Visibility	10 minutes	*
Ceiling	30 minutes	35 minutes
Freezing Ram	15 minutes	*

* Maximum time not applicable since phenomena may not be present. Minimum time applies if phenomena are present.

11. Verify that ASOS transmitted an hourly observation. Call the AOMC and tell them:

- a. Your location,
- b. that installation of the freezing rain sensor has been completed, and
- c. that ASOS is operational.

12. Enter in the SYSLOG that maintenance has been completed.

1. Key the **MAINT** screen.
2. Key the **ACTION** page.
3. Key **FMK** - Enter the Field Mod Kit (FMK) number as follows: **Mod 34**.
On the second line of the screen verify that only Mod 34 is displayed.
4. Check the **SYSLOG** and verify the **FMK** message. Notify the AOMC via telephone that Mod 34 has been completed.

13. At an expansion site with ATCT, the el tech will contact ATCT and supply information on the following:

- a. ASOS maintenance completed,
- b. ASOS restored to service, and


- c. tower CVDs and OIDs need to be turned on, and TRACON asked to turn on their displays.

REPORTING MODIFICATION

Target date for completion of this modification is 30 days after receipt of parts. Report completed modification on WS Form A-26, Engineering Maintenance Reporting System Maintenance Record, according to instructions in EHB-4, part 2 use reporting code **AZR**. Also, record the modification number in block 17(a) as 11 (see appendix G for a completed sample of WS Form A-26). Record the serial number for the freezing rain sensor.

Make appropriate entries in the SYSLOG using the Maintenance Action keys, Field Modification keys, and comment fields. Follow these steps:

1. Log on as **TECH**.
2. Key the **MAINT** screen.
3. Key the **ACTION** page.
4. Key **START** - Stop here and perform the modification.
After Mod Note number 34 is complete log on system.


Acting Chief, Engineering Division

Attachments

Appendix A - Parts List
Appendix B - Modification Instructions
Appendix C - Test Sites
Appendix D - Sites Requiring Poles and Sensors
Appendix E - Sites Requiring the Upgraded Circuit Breaker
Appendix F - Sites Requiring Freezing Rain Sensor Only
Appendix G - EMRS Sample A-26 Form

PARTS LIST

F/N	Qty.	P/N	NOMENCLATURE	
32	4 E A	MS35308-468	Screw, Hex Head	*
33	4 E A	MS51971-7	Nut, Hex	*
34	4 E A	MS35338-145	Washer, Lock	*
35	4 E A	MS 15795-820	Washer, Flat	*
39	1 E A	62828-90253-1	Lug	*
40	1 E A	62828-90254-1	Connector, Split Bolt	*
41	1 E A	62828-90115-10	Freezing Pain Sensor	
	1 E A	62828-90324-1	Mounting Pole	*
93	1 E A	62828-40213-1	Liner, Plastic	*
	6 Ft	QQW343S10S1B	Wire, Solid Copper	*
	1 E A	62828-PWR-HAR	AC Power Harness	*
	1 E A	62828-40155-90	Circuit Breaker Module	*
	1 E A	62828-90006- 1	Fiber Optic Modem	*
	6 Ft	62828-90096- 1	Flexible Conduit	*
	1 E A	62828-42040-30	Fiber Optic Cable	*
	4 E A	62828-90075-1	Screw, Metric	*
	4 E A	MS35338-134	Washer Look	*
	1 E A	DCPA3A7RX	Marker	*
	1 E A	DCPA3A7TX	Marker	*
	1 E A	62828-90256-1	Cable Ties	*
	2 E A	62828-90097-1	Connector, Flex Conduit	*
	2 E A	62828-90293-1	O-Ring Gasket	*
	5 E A	62828-90132-11	Terminal Lug, Spade	*

These (*), may have been installed during the system installation. Extra materials must be returned to the NRC, attention ASOS repair.

MODIFICATION INSTRUCTIONS

This procedure describes the reconfiguration of the DCP to accommodate the freezing rain sensor. The FREEZING RAIN SENSOR requires a separate circuit breaker for heater power and the VISIBILITY SENSOR only requires electronic power. SKIP STEPS 4 THROUGH 14 AND 45 and 46 IF VISIBILITY CIRCUIT BREAKER MODULE IS ALREADY IN SLOT A1A3A8. Those sites listed in Appendix C only require the installation of the freezing rain sensor. FOR FREEZING RAIN SENSOR INSTALLATION ONLY COMPLETE STEPS 1,2,29 THROUGH 39, 41 THROUGH 43, AND 47 THROUGH 49. Follow the instructions listed below to make this modification.

1. Open the DCP door, set UPS power switch to 0 (OFF) on CLASS II systems only, and turn OFF the UPS POWER CIRCUIT BREAKER A1A3A1.
2. Open the DCP power distribution panel and turn OFF the DCP power. This will remove all power to the DCP and the sensors.
3. Is there a VIS circuit breaker module in A1A3A8? ^{A3} If ^{no} yes, go to next step. If ^{yes} no, skip to step 15.
4. Remove circuit breaker module A1A3A3 VIS and insert into A1A3A8 position.
5. Open the DCP Faraday box (A3) to access the sensor power wiring and the fiber optic modems.
6. Remove the blank cover from A7 position and save the gasket.
7. Install fiber optic modem (62828-90006-1) and the gasket in position A7 using screws (62828-90075-1) and washers (MS35338-134).
8. Locate the SIO connector in the DCP harness marked A3A7J1. Connect this connector to fiber optic modem just installed in position A7 and tighten the screws on the connector.

NOTE: In steps 9, 10, and 11 the changes are made to the power connections on the terminal boards on the inside of the Faraday box (A3) door.

9. Remove the black and red wires from terminal board A17-4 and move them to terminal A1 7-9.

10. Remove white and yellow wires from A18-4 and move them to A18-9.

11. Remove green wire from A18-4G and move it to A18-9G.

NOTE: As sleeves are removed and replaced check the size of these sleeves to ensure proper fit.

12. Remove the fiber optic cable marked DCPA3A2TX. Remove marker sleeve and replace with marker sleeve DCPA3A7TX.

13. Remove the fiber optic cable marked DCPA3A2RX. Remove marker sleeve and replace with marker sleeve DCPA3A7RX.

14. Connect the fiber optic cable to the fiber optic modem in position A7. Ensure that the RX and TX are properly connected.

15. Install FZR circuit breaker module (62828-40155-90) into slot A3.

NOTE: If VIS circuit breaker module was moved in step 4 skip to step 19.

16. Open the DCP Faraday box (A3) to gain access to the sensor power wiring and the fiber optic modems and remove the blank cover from A2 position and save the gasket.

17. Install fiber optic modem (62828-90006-1) and the gasket in position A2 using screws (62828-90075-1) and washers (MS35338-134).

18. Locate the SIO connector in the DCP harness marked A3A2J1. Connect this connector to fiber optic modem located in position A2 and tighten the screws on the connector.

19. At pedestal No. 3 remove the cover on top of the raceway and the access plug on the side of the raceway.

20. Install connectors P/N 62828-90097-1 on both ends of the 6 foot piece of flex conduit P/N 62828-90096-1. Remove retaining nut from one end of conduit and install O-ring gasket P/N 62828-90293-1 on connector. Locate pull cord inside of the raceway and bring pull cord out through retaining nut (retaining nut MUST be installed on inside of raceway) and side hole of raceway. Secure flex conduit to raceway.

21. Attach fiber optic cable (62828-42040-30) and power wiring harness (16 AWG. black, 16 AWG. white, 16 AWG. red, 16 AWG. yellow and 16 AWG. green wire) to pull cord. Locate other end of pull cord in the DCP Faraday box and pull the fiber optic cables and power wiring through raceway into Faraday box. Allow enough length to connect to the fiber optic modem.

CAUTION

Fiber optic cables are delicate and should be handled with care.

22. Connect fiber optic cable marked DCPA3A2TX and DCPA3A2RX to fiber optic modem installed in position A2. Ensure that the RX and TX are properly connected.
23. Strip 1/4-inch insulation off of black wire and connect to terminal A17-4.
24. Strip 1/4-inch insulation off of white wire and connect to terminal A18-4.
25. Strip 1/4-inch insulation off of red wire and connect to terminal A17-20.
26. Strip 1/4-inch insulation off of yellow wire and connect to terminal A18-20.
27. Strip 1/4-inch insulation off of green wire and connect to terminal A18-4G.
28. At sensor pedestal No. 3 install freezing rain sensor mounting pole (P/N 62828-90324-1) with plastic liner (P/N 62828-40213-1) between pedestal and mounting pole using four hex head screws (P/N MS35308468), four hex nuts (P/N MS5 1971-7), four lock washers (P/N MS35338-145), and eight flat washers (P/N MS15795-820).

CAUTION -- DO NOT TOUCH SENSOR TIP!

1. The freezing rain sensor's protective cover and tip cover must be removed prior to operation.
2. The sensor tip gets extremely hot and can also be damaged by oils from fingertips.
29. Install freezing rain sensor P/N 62828-90115-10 on mounting pole using hardware supplied with sensor. Refer to installation drawing for proper orientation of sensor.
30. Open door of freezing rain sensor. Remove retaining nut from end of flex conduit and install O-ring gasket P/N 62828-90097-1 on conduit. Route fiber optic cable, power wiring, and flex conduit through entry hole on sensor. Secure flex conduit to sensor using retaining nut that was removed previously in this step.
31. Cut black wire to length, strip and install terminal lug P/N 62828-90132-11 on wire and connect wire to TB1-1.
32. Cut white wire to length, strip and install terminal lug P/N 62828-90132-11 on wire and connect wire to TB-2.

33. Cut green wire to length, strip and install terminal lug P/N 62828-90132-11 on wire and connect wire to TB-3.
34. Cut red wire to length, strip and install terminal lug P/N 62828-90132-11 on wire and connect wire to TB-4.
35. Cut yellow wire to length, strip and install terminal lug P/N 62828-90132-11 on wire and connect wire to TB-5.
36. Connect fiber optic cable to fiber optic modem making sure RX and TX are installed properly.
37. Install lug P/N 62828-90253-1 on 6-foot piece of 10 AWG. solid wire PM QQW343S10S1B. Connect wire to ground stud on sensor using hardware supplied with sensor. Connect other end of ground wire to system ground wire running along top of raceway using split bolt connector P/N 62828-90254-1.
38. Secure flex conduit and ground wire to sensor pole using Tywrap P/N 62828-90256-1. See installation drawing for approximate location.
39. Close the sensor door and reinstall cover on top of raceway using existing hardware.
40. Close Faraday box and secure using existing hardware.
41. Set the freezing rain sensor circuit breakers (P/N 62828-90155-90) A1A3A2 ON. CB1 and CB2 need to be turned ON.
42. Turn UPS OUTPUT POWER A1A3A1 ON. Set UPS power switch to 1 (ON) CLASS II SYSTEMS ONLY.
43. Turn ON the DCP Power Circuit Breaker in Power Distribution Panel. Close and secure power distribution panel door. Power is now restored to DCP and all sensors. Secure DCP door.

NOTE: The physical installation of the freezing rain sensor is now complete. The freezing rain sensor must now be configured on the system. The setup of sensor is accomplished through the OID.

44. If you moved VISIBILITY from A1A3A3 TO A1A3A8 go to next step. If VISIBILITY circuit breaker was not moved skip to step 46.

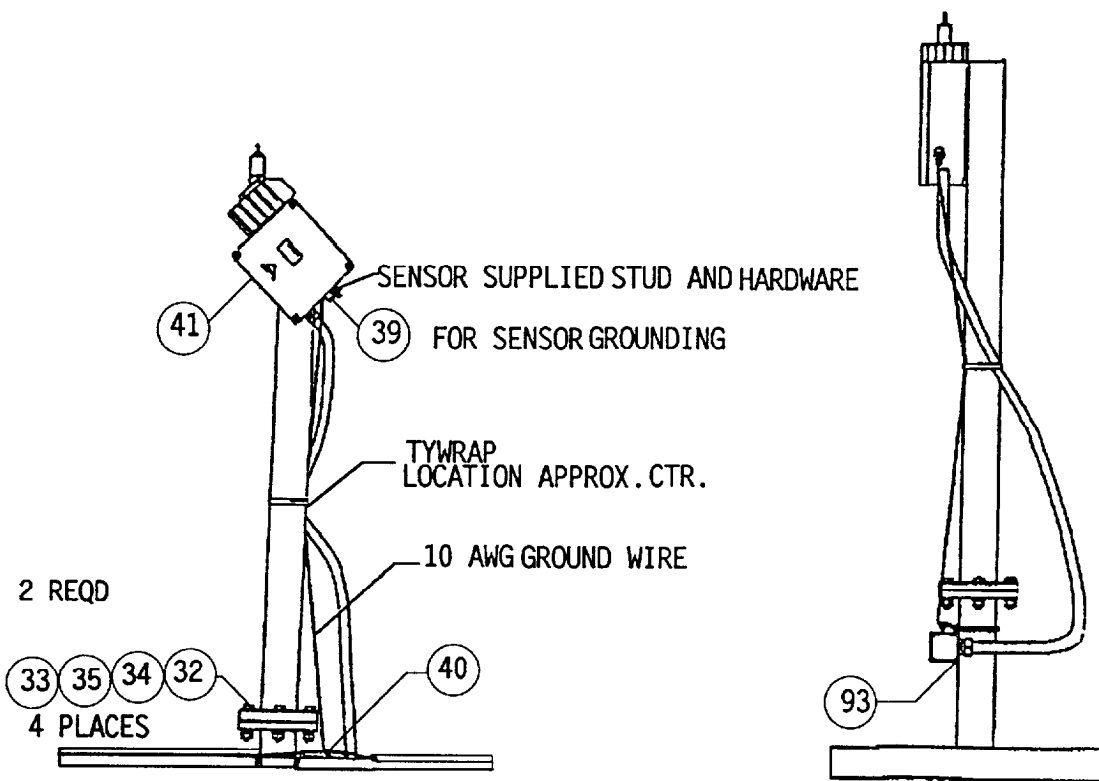
45. Sign on OID as a **TECHNICIAN** and Press **REVUE - SITE - CONFIG - SENSR CHANG.**
Move cursor to SIO #1 Port 3 and type **FR** on keyboard.
Move cursor to SIO #2 Port 4 and type **VI** on keyboard.
Press **BACK - ALGOR** to verify visibility configuration.
Press **EXIT.**
46. Press **MAINT** and move cursor to DCP #1.
Press **SEL** and move cursor to FREEZING RAIN.
Press **SEL** and verify sensor response status.
Press **BACK** and move cursor to VISIBILITY #1.
Press **SEL** and verify sensor response status.
Press **EXIT-REVUE-SENSR- 2-HR** Vis EXCO-will be displayed under VIS #1
Press **PAGE.** Frequency of freezing rain probe will be displayed under ZR. Nominal frequency is 40kHz.
Press **EXIT** After 10 minutes of operation visibility will be displayed on one minute screen.
Press **MAINT** and clear fail counts for freezing rain and visibility sensors. Press **EXIT.**
47. Sign on OID as a **TECHNICIAN** and Press **REVUE - SITE - CONFIG - SENSR - CHANG.**
Move cursor to SIO #1 Port 3 and type "FR" on keyboard.
Press **EXIT.**
48. Press **MAINT** and move cursor to DCP #1
Press **SEL** and move cursor to FREEZING RAIN
Press **SEL** and verify sensor response status
Press **EXIT - REVUE - SENSR - 12-HR - PAGE.** Frequency of Freezing Rain probe will be displayed under ZR. Nominal Frequency is approximately 40kHz.
Press **EXIT** ZRNO will not be displayed in the **REMARKS** segment.
Press **MAINT** and clear Fail Counts for all sensors.
Press **EXIT.**
49. *If the ACU firmware is earlier than version 2.3 or Engineering Modification Note 31 has not been completed, the freezing rain sensor must be deconfigured. Early versions of the ACU firmware incorrectly control the freezing rain heater power and incorrectly calculates freezing rain accumulations.*

This completes installation of freezing rain sensors.

MODIFICATION

WIRING INSTRUCTIONS

FROM	TO	WIRE No.	COLOR
Visibility	DCP		
TB1-1	A17-9	6	BLACK
TB1-2	A18-9	6	WHITE
TB1-3	A18-9G	6	GREEN
TB1-4	A17-9	6	RED
TB1-5	A18-9	6	YELLOW
TX	RX		FIBER OPTIC CABLE
RX	TX		FIBER OPTIC CABLE
Freezing Rain	DCP		
TB1-1	A17-45		BLACK
TB1-2	A18-4	5	WHITE
TB1-3	A18-4G	5	GREEN
TB1-4	Al 7-20	5	RED
TB1-5	Al 8-20	5	YELLOW
TX	R x		FIBER OPTIC CABLE
R x	TX		FIBER OPTIC CABLE



INSTALLATION DRAWING

Listed below are eight ASOS freezing rain test sites.

Site ID

- | | |
|--------|----------|
| 1. 3R5 | FAA site |
| 2. AHN | NWS site |
| 3. ANC | NWS site |
| 4. FAR | NWS site |
| 5. SLC | NWS site |
| 6. JST | FAA site |
| 7. BGM | NWS site |
| 8. CLE | MWS site |

The following sites require the freezing rain sensor pole kit S100-2MT3MP1 to be installed.
Contact Bob McCormick at 301-713-1835 if any ASOS site does not have the mounting pole and signal cable.

Appendix E

The following sites need circuit breakers, S100-2A1A3A3-1.

S I D	C I T Y	STATE	TYP E	NWS_RGN
ALS	Alamosa	C O	N	Central
CNK	Concordia	K S	N	Central
COS	Colorado Springs	C O	N	Central
GRI	Grand Island	N E	N	Central
MCI	Kansas City	M O	N	Central
PUB	Pueblo	C O	N	Central
TOP	Topeka	K S	N	Central
TUL	Tulsa	O K	N	Central

N= National Weather Service

SID	CITY	STATE	TYPE	FR	NWS_LGN
ELY	ELY	N V	N	Y	Western
EUG	EUGENE	O R	N	Y	Western
FAT	FRESNO	C A	N	Y	Western
FCA	KALISPELL	M T	N	Y	Western
GEG	SPOKANE	W A	N	Y	Western
HLN	HELENA	M T	N	Y	Western
HVR	H A V R E	M T	N	Y	Western
OLM	OLYMPIA	W A	N	Y	Western
PDX	PORTLAND	O R	N	Y	Western
RDD	REDDING	C A	N	Y	Western
RNO	RENO	NV	N	Y	Western
SCK	STOCKTON	CA	N	Y	Western
SLE	SALEM	OR	N	Y	Western
WMC	WINNEMUCCA	NV	N	Y	Western
ALS	ALAMOSA	CO	N	Y	Central
K	CONCORDIA	KS	N	Y	Central
COS	COLORADO SPRINGS	CO	N	Y	Central
GRI	GRANDISLAND	NE	N	Y	Central
MCI	KANSAS CITY	MO	N	Y	Central
PUB	PUEBLO	CO	N	Y	Central
TOP	TOPEKA	K S	N	Y	Central
TUL	TULSA	O K	N	Y	Central

Appendix F

The following sites need freezing rain sensor, SI00-2MT3 only. WSH will issue one sensor for each of these sites.

SID	CITY	STATE	TYPE	FR	NWS	RGN
APN	ALPENA	MI	N	Y	Central	
BFF	SCOTTSBLUFF	NE	N	Y	Central	
COU	COLUMBIA	MO	N	Y	Central	
CVG	COVINGTON/CINCINNATI	KY	N	Y	Central	
DSM	DES MOINES	IA	N	Y	Central	
DTW	DETROIT	MI	N	Y	Central	
EVV	EVANSVILLE	IN	N	Y	Central	
FAR	FARGO	ND	N	Y	Central	
FNT	FLINT	MI	N	Y	Central	
FWA	FORT WAYNE	IN	N	Y	Central	
HON	HURON	SD	N	Y	Central	
HTL	HOUGHTON LAKE	MI	N	Y	Central	
IND	INDIANAPOLIS	IN	N	Y	Central	
INL	INTERNATIONAL FALLS	MN	N	Y	Central	
LAN	LANSING	MI	N	Y	Central	
LNK	LINCOLN	NE	N	Y	Central	
MKE	MILWAUKEE	WI	N	Y	Central	
MKG	MUSKEGON	MI	N	Y	Central	
MLI	MOLINE	IL	N	Y	Central	
MSN	MADISON	WI	N	Y	Central	
ORD	CHICAGO	IL	N	Y	Central	
PIA	PEORIA	IL	N	Y	Central	
RAP	RAPID CITY	SD	N	Y	Central	
RFD	ROCKFORD	IL	N	Y	Central	
SBN	SOUTH BEND	IN	N	Y	Central	
SDF	LOUISVILLE	KY	N	Y	Central	

SID	CITY	STATE	TYPE	FR	NWS_RGN
SPI	SPRINGFIELD	IL	N	Y	Central
STC	ST CLOUD	MN	N	Y	Central
SUX	SIOUX CITY	IA	N	Y	Central
VTN	VALENTINE	NE	N	Y	Central
ABE	ALLENTOWN	PA	N	Y	Eastern
ACY	ATLANTIC CITY	NJ	N	Y	Eastern
AVP	WILKESBARRE-SCRANTON	PA	N	Y	Eastern
BDL	WINDSOR LOCKS	CT	N	Y	Eastern
BDR	BRIDGEPORT	CT	N	Y	Eastern
BKW	BECKLEY	WV	N	Y	Eastern
BOS	BOSTON	MA	N	Y	Eastern
BWI	BALTIMORE	MD	N	Y	Eastern
CAK	AKRON	OH	N	Y	Eastern
CMH	COLUMBUS	OH	N	Y	Eastern
CON	CONCORD	NH	N	Y	Eastern
CRW	CHARLESTON	WV	N	Y	Eastern
DAY	DAYTON	OH	N	Y	Eastern
DCA	WASHINGTON DC	DC	N	Y	Eastern
EKN	ELKINS	WV	N	Y	Eastern
E R I	ERIE	PA	N	Y	Eastern
IAD	WASHINGTON DC	DC	N	Y	Eastern
ILG	WILMINGTON	DE	N	Y	Eastern
I P T	WILLIAMSPORT	PA	N	Y	Eastern
JFK	NEW YORK	NY	N	Y	Eastern
LYH	LYNCHBURG	VA	N	Y	Eastern
MFD	MANSFIELD	OH	N	Y	Eastern
ORF	NORFOLK	VA	N	Y	Eastern
ORH	WORCESTER	MA	N	Y	Eastern
PHL	PHILADELPHIA	PA	N	Y	Eastern
PVD	PROVIDENCE	R I	N	Y	Eastern

SID	CITY	STATE	TYPE	FR	NWS_RGN
PWM	PORTLAND	ME	N	Y	Eastern
RDU	RALEIGH/DURHAM	NC	N	Y	Eastern
RIC	RICHMOND	VA	N	Y	Eastern
ROA	ROANOKE	VA	N	Y	Eastern
TOL	TOLEDO	OH	N	Y	Eastern
YNG	YOUNGSTOWN	OH	N	Y	Eastern
ACT	WACO	TX	N	Y	Southern
AGS	AUGUSTA	GA	N	Y	Southern
AHN	ATHENS	GA	N	Y	Southern
ATL	ATLANTA	GA	N	Y	Southern
AUS	AUSTIN	TX	N	Y	Southern
BNA	NASHVILLE	TN	N	Y	Southern
CHA	CHATTANOOGA	TN	N	Y	Southern
CSG	COLUMBUS	GA	N	Y	Southern
DFW	DALLAS/FORT WORTH	TX	N	Y	Southern
FSM	FORT SMITH	AR	N	Y	Southern
HSV	HUNTSVILLE	AL	N	Y	Southern
IAH	HOUSTON	TX	N	Y	Southern
LBB	LUBBOCK	TX	N	Y	Southern
MCN	MACON	GA	N	Y	Southern
MEI	MERIDIAN	MS	N	Y	Southern
MGM	MONTGOMERY	AL	N	Y	Southern
OKC	OKLAHOMA CITY	OK	N	Y	Southern
SAT	SAN ANTONIO	TX	N	Y	Southern
TRI	BRISTOL/JOHNSON/KINGSPORT	TN	N	Y	Southern
TUP	TUPELO	MS	N	Y	Southern
TYS	KNOXVILLE	TN	N	Y	Southern
AST	ASTORIA	OR	N	Y	Western
BIL	BILLINGS	MT	N	Y	Western
BNO	BURNS	OR	N	Y	Western

SID	CITY	STATE	TYPE	FR	NWSRGN
ELY	ELY	NV	N	Y	Western
EUG	EUGENE	OR	N	Y	Western
FAT	FRESNO	CA	N	Y	Western
FCA	KALISPELL	MT	N	Y	Western
GEG	SPOKANE	WA	N	Y	Western
HLN	HELENA	MT	N	Y	Western
HVR	HAVRE	MT	N	Y	Western
OLM	OLYMPIA	WA	N	Y	Western
PDX	PORTLAND	OR	N	Y	Western
RDD	REDDING	CA	N	Y	Western
RNO	RENO	NV	N	Y	Western
SCK	STOCKTON	CA	N	Y	Western
SLE	SALEM	OR	N	Y	Western
WMC	WINNEMUCCA	NV	N	Y	Western
ALS	ALAMOSA	CO	N	Y	Central
CNK	CONCORDIA	KS	N	Y	Central
COS	COLORADO SPRINGS	CO	N	Y	Central
GRI	GRANDISLAND	NE	N	Y	Central
MCI	KANSAS CITY	MO	N	Y	Central
PUB	PUEBLO	CO	N	Y	Central
TOP	TOPEKA	KS	N	Y	Central
TUL	TULSA	OK	N	Y	Central

WS E ONLY		WS FORM A-26 (4/94) <small>Supersedes WS Form A-23 and WS Form H-28, which are obsolete</small>					U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE			Document Number <h1 style="margin: 0;">G49978</h1>			
ENGINEERING MANAGEMENT REPORTING SYSTEM		MAINTENANCE RECORD											
<i>General Information</i>		1. Open Date 10 / 24 / 95		Time 0900		2. Initials MRB		3. Response Priority (check one) <input type="radio"/> Immediate <input type="radio"/> Low <input type="radio"/> Routine <input checked="" type="radio"/> Not Applicable		4. Close Date 10 / 24 / 95		Time 1300	
5. Description INSTALL FREEZING RAIN SENSOR (AZR) I.A.W. MOD NOTE 34													
<i>Equipment Information</i>		6. Station ID FWA		7. Equipment Code AZR		8. Serial Number 0106		9. TM M		10. AT M		11. How Mal. 999	
12. EQUIPMENT OPERATIONAL STATUS TIMES		a. Fully Operational <div style="border: 1px solid black; height: 20px; width: 80px; margin: 0 auto;"></div>		b. Logistics Delay <div style="border: 1px solid black; height: 20px; width: 80px; margin: 0 auto;"></div>		Partly Operational		c. All Other <div style="border: 1px solid black; height: 20px; width: 80px; margin: 0 auto;"></div>		d. Logistics Delay <div style="border: 1px solid black; height: 20px; width: 80px; margin: 0 auto;"></div>		Not Operational	
										e. All Other <div style="border: 1px solid black; padding: 2px;">04:00</div>			
13. Parts Failure Information										14. Work Load Information			
Block #	a. ASN	b. NSN	c. TM	d. AT	e. How Mal.	f. Qty.	g. Maint. Hrs.	Type	Staff Hrs.				
1								a. Routine					
2								b. Non-routine					
3								c. Travel					
4								d. Misc.	004:00				
5								e. Overtime					
<i>Miscellaneous Information</i>		15. Maintenance Comments PERFORMED MOD NOTE 34 AS DIRECTED										16. Initials MRB	
17. SPECIAL PURPOSE REPORTING		a. Mod. No. 34		b. Mod./Act./Deact. Date 10/24/95		c.		d.		e.			
18. CONFIGURATION MGMT. REPORTING (use as directed)		a. Block #		b. Manufacturer's Part No. of New Part						c. Revision No. of New Part			

ASOS MODIFICATION NOTE 35 (for Electronics Technicians)

Engineering Division

W/OSO321:BGM

SUBJECT	Upgrade to the ASOS Heating Tipping Bucket and Wind Skirt
PURPOSE	To add operational enhancements for the ASOS Heating Tipping Bucket.
EQUIPMENT AFFECTED :	ASOS Heated Tipping Bucket (AHTB) S100-2MT6.
PARTS REQUIRED	Frame Assembly W/ Reed switch, Bar Magnet, Tipping Bucket and Polyethylene stops P/N B-3000-724 (1 ea.), Compression Adapter P/N 5K117 (1 ea.), Nameplate P/N 7405HA-40 (1 ea.), Wind Skirt Attachment Device, and P/N 2125-00201 (1 ea.).
MOD PROCUREMENT	WSH will issue one Wind Skirt device (S100-FMK049A) for each site that has an alter wind shield. WSH will issue one frame assembly, (S100-2MT6A2A1-1), and one funnel and label kit, (S100-FMK049B) for each ASOS.
SPECIAL TOOLS REQUIRED	None
TIME REQUIRED	2 hours
EFFECT ON OTHER INSTRUCTIONS	None
AUTHORIZATION	This modification is authorized by Engineering Change Proposals E92SM05F058, E93SM05F065, E93SM05F096, E94SM05F116, and APO005.
VALIDATION STATEMENT	This modification was successfully tested at the Test and Evaluation Branch in Sterling, Virginia, WSH, and test sites listed in Appendix A.

GENERAL:

Modification Note 35 provides instructions for replacing the ASOS tipping bucket gauge frame assembly which includes the polyethylene stops, reed switch, and a bar magnet. This note also provides instructions for replacement of the tubing and plastic clamps for the wind skirt, the funnel extension, and configuration labels. The current gauges will be modified with a redesigned frame assembly, reed switch and bar magnet (ASN S100-2MT6A2A1-1). A two-way aluminum connector, for the heated tipping bucket (HTB) wind skirt, will replace the tubing and clamps located on the lower ring attachment devices (ASN S100-2MT6A3MP1-1). The funnel extension and configuration labels are attached to the funnel and the outside of the tipping bucket respectively.

The brass stops have been replaced with a polyethylene material that prevents sticking. The funnel extension was added to improve the accuracy of the rain gage. The tubing and plastic clamps are replaced with a two-way aluminum connector, similar to the one used on the upper ring. The new frame assembly reed switch and a bar magnet are factory assembled and calibrated before being shipped. Do not adjust the reed switch. Do not interchange the tipping buckets and frames.

BEFORE STARTING INSTALLATION

1. Call the AOMC at 1-800-242-8194 and provide notification on which ASOS you will be installing the modification.
2. Get approval of the responsible MIC/OIC before starting installation. You may install on any day of the month.
3. Make the appropriate SYSLOG entries (MAINT-ACT-FMK) Mod 35.
 - a. Log on as **TECH**.
 - b. Key the **MAINT** screen.
 - c. Key the **ACT** page.
 - d. Key **START** - Stop here and perform **Mod 35**.
 - e. Upon completion of **Mod 35**, log onto the system.
4. Follow the instructions for ASOS Modification Note 35, starting on page 3 and continuing until the these procedures are completed.

REMOVAL OF FRAME ASSEMBLY, WITH MERCURY SWITCH/REED SWITCH AND HORSE SHOE MAGNET
INSTALLATION OF FRAME ASSEMBLY WITH REED SWITCH AND BAR MAGNET
INSTALLATION OF COMPRESSION FITTING
REMOVAL AND INSTALLATION OF NAME PLATE
REMOVAL AND INSTALLATION OF WIND SKIRT ATTACHMENT DEVICES

AFTER COMPLETING INSTALLATION

5. Run the 10 tip test to confirm that the tipping bucket is operating correctly. If the test passes go to next step. If tipping bucket fails test, order a tipping bucket frame assembly from NLSC.
6. Inform the office staff that ASOS is again operational. The chart below indicates how long it takes after a start up for ASOS to report the observation element automatically.

Times Needed for Elements to be Reported Automatically

Minimum Maximum

Precipitation Type 2 minutes *

* Maximum time not applicable since phenomena may not be present. Minimum time applies if phenomena are present.

7. Verify that ASOS transmitted an hourly observation. Call the AOMC at 1-800-242-8194 and tell the operator:
 - a. Your location (SID).
 - b. That ASOS is operational.
8. Enter in the SYSLOG that maintenance has been completed.
 - a. Key the **MAINT** screen.
 - b. Key the **ACT** page.
 - c. Key **FMK** - Enter the Field Mod Kit (FMK) number as follows: **Mod 35**
On- the second line of the screen verify that only **Mod 35** is displayed. Complete by entering Y in the Y/N if only **Mod 35** is displayed.
 - d. Check the **SYSLOG** and verify the **FMK** message.

PROCEDURE:

REMOVAL OF FRAME ASSEMBLY, WITH MERCURY SWITCH/REED SWITCH AND HORSESHOE MAGNET AND TIPPING BUCKET

1. At the DCP, turn the heating tipping bucket (HTB.) circuit breaker to OFF (right) position.
2. Loosen the two knobs on the HTB, and remove the top assembly.

NOTE: Horseshoe magnets are attached to the tipping bucket by a dotter pin. The bar magnet is attached by epoxy.

3. Remove the tipping bucket from the frame.
4. Remove two screws from the ends of the frame assembly. Keep the two screws removed.

WARNING: While doing step five do not allow the two wires being disconnected to touch. This will prevent battery drain.

5. Disconnect the wiring harness two wires from the transmitter to the bucket frame terminal board 2MT6A2A1TB1.

NOTE: Do not break the glass housing of the mercury switch, if installed. (mercury is a hazardous material).

6. Remove the mercury switch from the mounting bracket, if installed, and carefully pack the mercury switch to prevent breakage.
7. Remove the tipping bucket from the frame assembly. Carefully pack the tipper separate from the frame to prevent damage.
8. This concludes the removal of the frame assembly.

INSTALLATION OF FRAME ASSEMBLY AND REED SWITCH

1. Install the frame assembly in the rain gauge using the two screws removed in step three of the removal procedure.
2. Unpack and install the tipping bucket in the frame assembly being sure the magnet is on the same side as the reed switch. Ensure the tipping bucket moves freely.
3. Connect the wiring harness two wires from the transmitter to the bucket frame terminal board 2MT6A2A1TB1.

NOTE: Do not attempt to adjust the reed switch. The reed switch is factory adjusted and should not be adjusted.

4. This concludes the installation of the frame assembly and reed switch.

SHIPPING INSTRUCTIONS

After the modification has been accomplished, carefully package the frame assembly for shipment to the National Reconditioning Center (NRC). Complete and attach a WS Form H-14 for each component returned. Wrap the tipping bucket, mercury switch, (ensure that a **HAZMAT** label is applied to the mercury switch package when appropriate) and the frame assembly separately in packing material and return to the NRC, use ASN S100-2MT6A2A1-OLD.

INSTALLATION OF COMPRESSION FITTING.

NOTE: If a compression fitting was previously installed on the rain gauge, skip this procedure.

1. Turn collector assembly of the rain gauge over so the bottom is facing you.
2. Install the compression fitting adapter (part of S100-FMK049B) over the spout of the funnel. Ensure that the adapter is well seated over the funnel. If the compression fitting adapter does not seat correctly, check for burrs on the funnel. Remove any burrs found on the funnel.
3. Using two wrenches, tighten the compression fitting until the adapter is secured to the rain gauge funnel.
4. Install the collector assembly onto the rain gauge. Check that the collector assembly is properly seated. Tighten the knobs on the side of the rain gauge.
5. This completes the installation of the compression fitting adapter procedure.

REMOVAL AND INSTALLATION OF NAMEPLATE

1. Remove the four screws holding the nameplate to the side of the rain gauge.
2. Attach the new nameplate (S100-FMK049B) to the rain gauge using the four screws removed in step one.
3. This completes the Installation of nameplate procedure.


REMOVAL AND INSTALLATION OF WIND SKIRT ATTACHMENT DEVICES

1. At the lower end of the wind skirt assembly remove one of the existing devices.
2. Reference attached drawing figure 1, and replace the removed assembly with a wind skirt attachment device P/N 2125 - 00201.
3. Repeat the process until all three existing attachment devices on the lower ring of the wind skirt are replaced.
4. This completes the Installation of wind skirt attachment devices.
Restore power and return to step 5 on page 3 " AFTER COMPLETING INSTALLATION."

REPORTING MODIFICATION

Reporting Modification

Target date for completion of this modification is 30 days after receipt of parts. Report completed modification on a Weather Service Form A-26 maintenance record, using instructions in EHB-4, Part 2, Appendix F, using reporting code AHTB. Record completion of MOD 35 in block 17a of the A-26 Form.. (see attachment for a completed sample of WS Form A-26).



John McNulty
Chief, Engineering Division

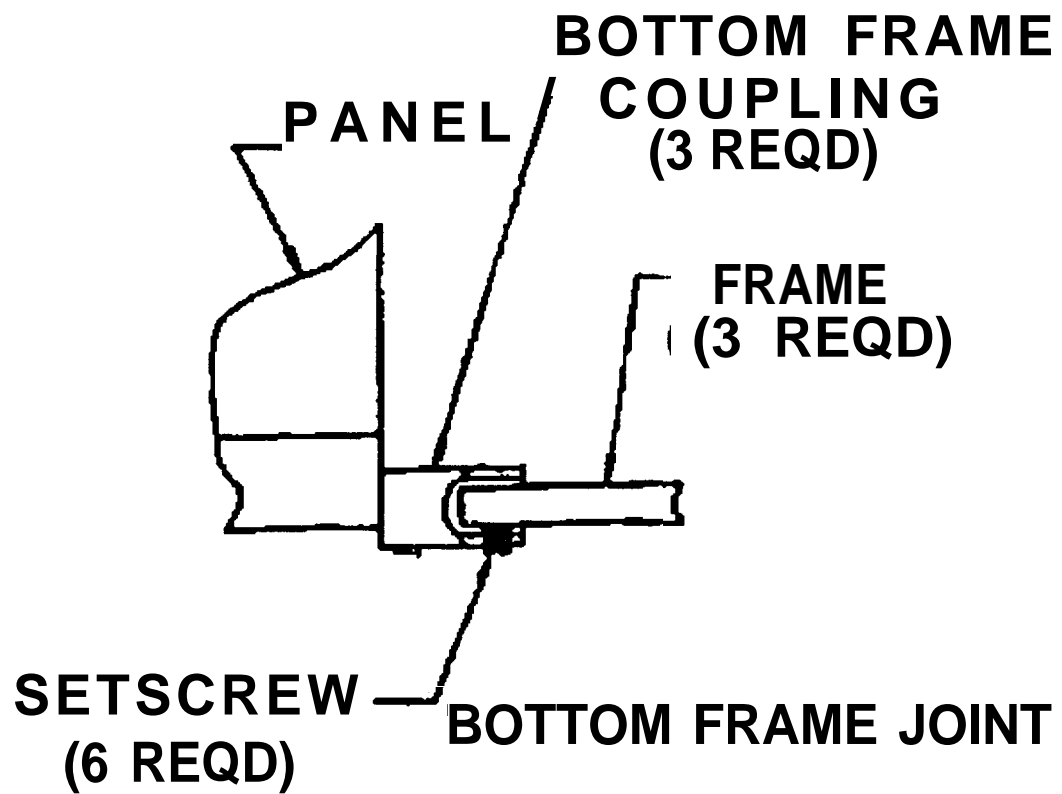


FIGURE 1

The following 12 sites will receive modified frame assemblies for testing.

REGION	SID
CENTRAL	JKL, PAH, SGF
EASTERN	CAE, GSP, ILM
SOUTHERN	AMA, BRO, LCH, JAN
WESTERN	AST, SEA

WS HQ USE ONLY	WS FORM A-26 (4/94) <small>Supersedes WS Form A-23 and WS Form H-28, which are obsolete</small>					<small>U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE</small>					Document Number <div style="font-size: 2em; font-weight: bold; text-align: center;">G 4 9 9 7 8</div>		
ENGINEERING MANAGEMENT REPORTING SYSTEM Maintenance Record													
General Information	1. Open Date 11 / 18 / 96		Time 0900		2. Initials MRB		3. Response Priority (check one) <input type="radio"/> Immediate <input type="radio"/> Low <input type="radio"/> Routine <input checked="" type="radio"/> Not Applicable			4. Close Date 11 / 18 / 96		Time 1100	
5. Description <div style="text-align: center; font-size: 1.2em; font-weight: bold;">MODIFY HEATED TIPPING BUCKET I.A.W. MOD NOTE 35</div>													
Equipment Information	6. Station ID JKL		7. Equipment Code AHTB		8. Serial Number 235			9. TM M		10. AT M		11. How Mal. 999	
12. EQUIPMENT OPERATIONAL STATUS TIMES		a. Fully Operational <div style="border: 1px solid black; height: 20px; width: 80px; margin: 0 auto;"></div>		b. Logistics Delay <div style="border: 1px solid black; height: 20px; width: 80px; margin: 0 auto;"></div>		Partly Operational		c. All Other <div style="border: 1px solid black; height: 20px; width: 80px; margin: 0 auto;"></div>		d. Logistics Delay <div style="border: 1px solid black; height: 20px; width: 80px; margin: 0 auto;"></div>		Not Operational <div style="border: 1px solid black; padding: 2px; text-align: center; font-weight: bold;">02:00</div>	
13. Parts Failure Information										14. Work Load Information			
Block #	a. ASN			b. NSN			c. TM	d. AT	e. How Mal.	f. Qty.	g. Maint. Hrs.	Type	Staff Hrs.
1												a. Routine	
2												b. Non-routine	
3												c. Travel	
4												d. Misc.	002:00
5												e. Overtime	
Miscellaneous Information		15. Maintenance Comments <div style="text-align: center; font-weight: bold; font-size: 1.1em;">PERFORMED UPGRADE TO HEATED TIPPING BUCKET AND WIND SKIRT</div>										16. Initials <div style="text-align: center; font-weight: bold; font-size: 1.2em;">MRB</div>	
17. SPECIAL PURPOSE REPORTING		a. Mod. No. 35		b. Mod./Act./Deact. Date 11/18/96		c.		d.		e.			
18. CONFIGURATION MGMT. REPORTING (use as directed)		a. Block #		b. Manufacturer's Part No. of New Part						c. Revision No. of New Part			

ASOS MODIFICATION NOTE 36 (for Electronics Technicians)

Engineering Division

W/OSO321:WW

SUBJECT	Wind Sensor Assembly Upgrade, Firmware Version 4.0
PURPOSE	To add operational enhancements for the ASOS wind sensor
EQUIPMENT AFFECTED	Automated Surface Observing System (ASOS)
PARTS REQUIRED :	EPROM, S100-2A8MT1A1A2-U7A, Rev. 4.0 (27C512)
MOD PROCUREMENT :	Electronics Technicians (ET) will order, from the National Logistics Supply Center (NLSC), one (1) EPROM for each ASOS site and one (1) EPROM for each spare processor.
SPECIAL TOOLS REQUIRED	IC Extraction Tool (ASN:041-T-13) IC Insertion Tool (ASN:041-T-16) Electrostatic Discharge (ESD) Straps
TIME REQUIRED	1 hour
EFFECT ON OTHER INSTRUCTIONS	ASOS Modification Note 22 is superseded.
EFFECTIVITY	All ASOS sites
CERTIFICATION STATEMENT	This modification is authorized by Engineering Change Proposal (ECP) E94SM05F118, Rev. C, This modification has been tested for operational integrity at the Field Systems Branch facility, located at Sterling, VA, and the following sites listed for the OT&E: Eastern Region - BTV, CHS, CLE, and ILM; Central Region - CYS, DDC, GLD, GRB, and LBF; Southern Region - ABQ, JAM, and MIA; and Western Region - AST, GGW, PDT, and PIH,

GENERAL

This modification note provides procedures and instructions for upgrading the ASOS wind system. The wind system upgrading is accomplished by removing the processor board from the wind system electronics enclosure and replacing the EPROM U7 (Revision 3.0 wind firmware) with Revision 4.0 firmware upgrade. Version 4.0 firmware upgrade corrects the data quality error reported in version 3.0.

Firmware Upgrade Changes Are to Include:

1. New diagnostic to detect a failed logic gate on the wind speed pulse input to the wind processor board.
2. The wind direction algorithm changed to accurately resolve the dead-band of the Potentiometer (POT).
3. New code to reject electronic noise in the dead band of a worn POT.
4. The wind speed and wind direction averaging algorithm changed from a "time-constant" type to a "running" type.
5. The capability to set the RS232 baud rate (via terminal) to 300, 1200, 2400, 4800, 9600, and 19200 using the new "WA" command was added. The new command provides the capability to set the "report rate" (for W1, W2, etc. outputs) to values ranging from 1 second to 255 seconds,
6. New diagnostic code records 100 wind direction POT readings following six independent zero crossings. If the POT has gone through zero, the next 100 POT readings will be recorded for six different zero crossings at an 88 Hz sampling rate.

PROCEDURE

Before Installation of Version 4.0 Firmware

1. Call the AOMC at 1-800-242-8194 and provide notification to which ASOS you will be installing the new wind firmware.
2. Get approval of the responsible MIC/OIC/Observer before starting the installation. Installation may be done on any day of the month if the restrictions in steps 3 and 4 are satisfied.
3. Commissioned Sites Only: Do not start installation during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of those conditions are expected within 3 hours. The responsible MIC/OIC/Observer will define those meteorological conditions.
4. Do not start firmware installation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Although 30 minutes should be sufficient, allow 1 hour to complete installation and restart ASOS.
5. Immediately before starting work at NWS-staffed sites, the MIC/OIC/Observer will inform the Air Traffic Control Tower (ATCT) and any other critical users that the ASOS wind speed and direction will be shut off for a firmware upgrade. At an unstaffed site, the ET will inform the ATCT using Controller Video Displays (CVD) and Operator Interface Devices (OID).

6. Do not begin the installation process until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.
7. Turn off the report processing for the wind sensor system.
8. Make the appropriate SYSLOG entries (MAINT-ACT-FMK) Mod 36.
 - a. Log on as **TECH**.
 - b. Key the **MAINT** screen.
 - c. Key the **ACT** screen.
 - d. Key **START** - Stop here and perform "Firmware 4.0 Installation Procedure."

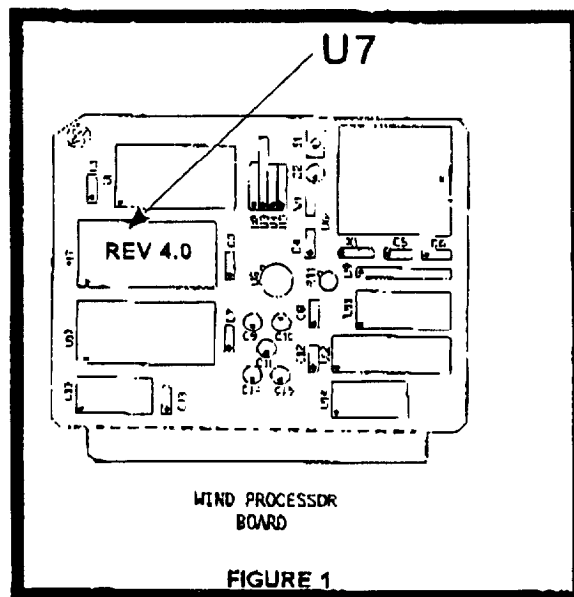
Firmware 4.0 Installation Procedure

9. At the DCP, switch the wind sensor breaker to the **OFF** position.
10. Open the wind sensor's electronics enclosure,
11. Remove the mounting hardware from the Printed Circuit Board (PCB) assembly and remove the PCB from the connector.

CAUTION:

Follow the Electrostatic Discharge (ESD) procedures, found in EHB-5, while removing and installing EPROMs.

12. Locate U7 (Rev. 3.0 or earlier) on the PCB and remove from the socket using the IC Extraction tool. (Refer to figure 1).



CAUTION:

Observe proper Pin 1 orientation and ensure EPROM legs do not become bent during the installation process.

13. Install the new EPROM (Rev. 4.0) into U7 socket using the IC Insertion tool.
14. Reinstall the PCB into the connector and be sure to seat the PCB fully.
15. At the DCP, switch the wind sensor breaker to the **ON** position.
16. Close and secure the wind system's electronics enclosure.
17. Continue with "After installation of Firmware 4.0."

After Installation of Version 4.0 Firmware

18. When the ASOS has been restarted at unstaffed sites, call to inform ATCT using the CVDs and OIDs to turn the displays back on. (At staffed sites, the MIC/OIC/Observer will call the ATCT.)
19. If the on-site NWS staff provides backup while the installation is underway, no special observation is needed when the wind system is restarted. Proceed with step 20.
20. Inform the office staff that the wind system is operational again. If less than **7** minutes remain until the next hourly observation, augmentation of the wind may be required. The chart below indicates how long it takes after a start up for the ASOS wind system to report the observation.

Times Needed for Elements to be Reported Automatically

Status Output	Minimum (minutes)	Maximum (minutes)
Wind Direction	2	7
Wind Speed	2	7

21. Verify that the wind data appears on the one-minute page. Call the AOMC at 1-800-242-8194 and inform the operator of the following information:
 - a. The ASOS location.
 - b. That installation of firmware version 4.0 has been completed.
 - c. That the wind system is operational.

22. Enter in the SYSLOG that maintenance has been completed.
 - a. Key the **MAINT** screen.
 - b. Key the **ACT** page.
 - c. Key **FMK** - Enter the Field Mod Kit (FMK) number as follows: **Mod 36**.
On the second line of the screen verify that only Mod 36 is displayed, Complete by entering Y in the [Y/N] field if only Mod 36 is displayed. When Mod 36 is completed, make appropriate log entries.
 - d. Check the SYSLOG and verify the FMK message. Enter a comment in the SYSLOG stating that version 4.0 firmware has been installed.
23. At an expansion site with ATCT, the ET will contact the ATCT and supply information on the following:
 - a. The ASOS maintenance is completed.
 - b. The ASOS is restored to service.
 - c. The ATCT CVDs, OIDs, and TRACON displays need to be turned back on.

Shipping Instructions

After Modification Note 36 has been completed, package the old EPROMs in an anti-static package and ship to the National Reconditioning Center (NRC), attention Roger Helphrey, ASOS repair. Items being returned should include the S100-2A8MT1A1A2-U7 (Rev. 3.0 EPROM) marked as S100-FMK-60 OLD.

Reporting Modification

For commissioned sites, a completion target date for this modification is 30 days after receipt of the parts, For other sites, the target date for completion is 60 days after receipt of parts. Report completed modification on a Weather Service Form A-26 Maintenance Record, following instructions in Engineering Handbook No. 4 (EHB-4), Engineering Management Reporting System, Part 2, Appendix F (use reporting code **AWIND**). Add in the comment field that version 4.0 firmware was installed.

Also, record the modification number in block 17a as 36 (see Appendix A for a completed sample of WS Form A-26).



John McNulty
Chief, Engineering Division

Appendix A

WS HQ USE ONLY	WS FORM A-26 (4/94) <small>Supersedes WS Form A-23 and WS Form H-28, which are obsolete</small>				<small>U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE</small>		Document Number <h1 style="margin: 0;">G 49978</h1>
ENGINEERING MANAGEMENT REPORTING SYSTEM MAINTENANCE RECORD							
<i>General Information</i>	1. Open Date 09, 08, 97	Time 0900	2. Initials MRB	3. Response Priority (check one) <input type="radio"/> Immediate <input type="radio"/> Low <input type="radio"/> Routine <input checked="" type="radio"/> Not Applicable		4. Close Date 09, 08, 97	Time 1300
5. Description FORM MODIFICATION TO UPGRADE ASOS WIND SYSTEM I.A.W. MOD NOTE 36							
<i>Equipment Information</i>	6. Station ID ORF	7. Equipment Code AWIND	8. Serial Number A0703		9. TM M	10. AT M	11. How Mal. 999
12. EQUIPMENT OPERATIONAL STATUS TIMES	a. Fully Oper. <input type="text"/> b. Logistics Delay <input type="text"/>	Partly Operational c. All Other <input type="text"/>		d. Logistics Delay <input type="text"/> Not Operational e. All Other <input type="text"/>		2:00 2:00	
<i>Part I - Part Information</i>							14. Work Load Information
Block #	a. ASN	b.	c. TM	d. AT	e. How Mal.	f. Qty.	g. Maint. Hrs.
1							
2							
3							
4							
5							
							a. Routine b. Non-routine c. Travel d. Misc. 04.00 e. Overtime
<i>Miscellaneous Information</i>	15. Maintenance Comments UPGRADED WIND SYSTEM. VERSION 2.0 FIRM INST						16. Initials MRB
17. SPECIAL PURPOSE REPORTING	a. Mod. No. 36	b. Mod/Act/Deact. Date 07/08/97	c.	d.	e.		
18. CONFIGURATION MGMT. REPORTING (use as directed)	a. Block #	b. Manufacturer's Part No. of New Part				c. Revision No. of New Part	

A-1

 EHB-11
 Issuance 97-14
 11/06/97

ASOS MODIFICATION NOTE 37 (for Electronics Technicians)

Engineering Division
W/OSO321:AJW

SUBJECT	Installing Visibility Firmware Version 037 and Visibility Crossarm Cable Guides
PURPOSE	To eliminate the heater diagnostic problem. Cable guides are added to restrain the cables from snagging and contacting the transmitter and receiver canisters.
EQUIPMENT AFFECTED:	ASOS VISIBILITY SENSOR (AVIS)
PARTS REQUIRED	: Visibility Firmware Version 037 S100-2MT5A1A1-U2, Firmware Version 037 and Cable Guide Kit or S100-FMK029-42.
MOD PROCUREMENT	: X Order part S100-2MT5A1A1-U2 for all sites except those listed in APPENDIX E. Order part S100-FMK029-42 for sites listed in APPENDIX E.
SPECIAL TOOLS REQUIRED	S100-TE305-1 may not be included in the visibility calibration kit S100-TE305. The jumper, Molex Connector S100-TE305-1 can be ordered directly from NLSC.
TIME REQUIRED	2 hours
AFFECT ON OTHER	Modification Note 13 and Errata sheet 1 are superseded. Refer to Maintenance Note 31. The transmitter optical Detector Function check, can be completed when this Modification is performed.
INSTRUCTIONS	
CERTIFICATION STATEMENT	This modification is authorized by Engineering Change Proposal E96SM05F157. This Modification was tested by the Engineering Division at Sterling Virginia, SMI, Belfort and the OT&E sites identified in APPENDIX C.

GENERAL

This modification note provides instructions for replacing the EPROM on the visibility sensor processor board. The updated firmware eliminates the visibility heater diagnostics and eliminates the false heater failure(s) that occur when the temperature drops below 40°F. The EPROM on the visibility processor board changes from firmware version 036 to 037.

The modification also provides instructions for installing two stainless steel cable guides in the visibility sensor crossarm assembly. The guides provide strain relief and keep the cable from snagging during insertion and removal of the transmitter and receiver canisters. Additional

instructions are provided for checking the soldering of the heater wire in the visibility transmitter and receiver canisters.

PROCEDURE

This procedure provides instructions for installing the EPROM (U2) version 037 on the visibility processor board. Included are installation instructions for the stainless steel cable guides.

BEFORE INSTALLING FIRMWARE

1. Call the AOMC at 1-800-242-8194. Inform the person who answers the phone at which office the new firmware will be installed.
2. For commissioned sites, get approval of the responsible MIC/OIC before starting installation. For noncommissioned sites, the el tech must coordinate with the site MIC/OIC before starting installation. Installation may be performed on any day of the month if permission is granted and the restrictions in steps 3 and 4 are complied with.
3. Commissioned Sites Only: Do not start installation during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of those conditions are expected within 3 hours. These meteorological conditions will be defined by the responsible MIC/OIC.
4. Do not start firmware installation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z.
5. Immediately before beginning work at NWS staffed sites, the MIC/OIC/Observer will inform the tower and any other critical users that the ASOS visibility sensor will be shut off for firmware upgrade (for unstaffed sites, the el tech will inform the tower).
6. Do not begin the installation process, until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.
7. The system voice function will automatically broadcast visibility missing messages when the visibility power is turned off.
8. Make the appropriate SYSLOG entries, (MAINT-ACT-FMK) Mod 037.
 - a. Log on a **TECH**.
 - b. Key the **MAINT** screen.
 - c. Key the **ACT** page.
 - d. Key **START** - Stop here and perform Mod 037.
Upon Completion of Mod 037, Log onto the system.
9. Continue with Appendix A and Appendix B if not completed previously.

AFTER INSTALLING FIRMWARE

10. When visibility is restarted at unstaffed sites, call to inform the tower that the work is complete. (At staffed sites, the MIC/OIC/Observer will call the tower).
11. If on-site NWS staff provides backup while the installation is underway, no special observation is needed when ASOS is restarted.
12. Inform office staff that ASOS is again operational. The chart below indicates how long it takes after start up for ASOS to report each observation element automatically.

Times Needed for Elements to be Reported Automatically

	<u>Minimum</u>	<u>Maximum</u>
Visibility	10 minutes	15 minutes
Obstruction to Visibility	10 minutes	

I Maximum time not applicable since phenomena may not be present. Minimum time applies if phenomena are present.

13. Verify that ASOS transmitted an hourly observation. Call the AOMC at 1-800-242-8194 and tell the operator:
 - a. Your location,
 - b. That installation of the new firmware has been completed, and
 - c. That ASOS is operational.
14. Enter the SYSLOG that maintenance has been completed.
 - a. Key the **MAINT** screen.
 - b. Key the **ACT** page.
 - c. Key **FMK** - Enter the Field Mod Kit (FMK) number as follows: **Mod 037**
On the second line of the screen verify that only **Mod 037** is displayed. Complete by entering Y in the Y/N if only Mod 037 is displayed. If **Mod 037** is completed, make appropriate log entry.
 - d. Check the SYSLOG and verify the FMK message. Enter a comment in the SYSLOG stating that Mod 037 has been installed and the Heater Diagnostics are disabled. Specifically identify sensors that have the heater diagnostics disabled. Notify the AOMC via telephone that Mod 037 and any other Mods have been completed. Clear any maintenance flags caused by installing this mod.
15. At an expansion site with Air Traffic Control Tower (ATCT), the el tech will contact ATCT and supply information on the following:
 - a. ASOS maintenance completed,
 - b. ASOS visibility has been restored to service.


REPORTING MODIFICATION

Target date for completion of this modification is 90 days after the receipt of parts. Report completed modification on a Weather Service Form A-26 maintenance record, using instructions in EHB-4, Part 2, Appendix F, use reporting code AVIS.

Also, record the modification number in block 17 (A) as 037 (see Appendix D for a completed sample of WS Form A-26).

NOTE:

Parts removed (EPROMs) should be properly packed and returned to NRC as S100-FMK0037.OLD. NRC will be reprogramming the EPROMs for other ASOS applications.



John McNulty
Chief, Engineering Division

Appendix A
Appendix B
Appendix C
Appendix D
Appendix E

INSTRUCTIONS

VISIBILITY SENSOR FIRMWARE REMOVAL AND REPLACEMENT PROCEDURE

Tools Required: Large flat-tipped screwdriver
No. 1 Phillips screwdriver

WARNING

Death or severe injury may result if power is not removed from sensor before performing maintenance activities.

1. At the DCP cabinet, set the visibility sensor circuit breaker module to OFF (right) position.
2. At the sensor, using the large flat-tipped screwdriver, open the visibility sensor electronics enclosure access door and locate the processor board A1A1 (P/N 32194-1). Using the Phillips screwdriver, remove captive screw securing processor board to standoff. This screw is on the bottom side of the board. See figures 1 and 2.
3. Carefully remove processor board by pulling it free from backplane connector XA1.
4. Using Figure 2, locate microcircuit U2. Remove the microcircuit using standard ESD precautions.
5. Install the supplied version 037 microcircuit, using care to match the index notch with the notch in the chip socket, assuring that pin 1 of the microcircuit matches pin 1 of the socket. Press firmly into socket.
6. Install processor board into backplane connector XA1.
7. Using Phillips screwdriver, install screw securing processor board to standoff.
8. Disconnect the DB-9 cable connector from the fiber optic modem inside the electronics enclosure on top of the Faraday box.
9. Connect the PC to the DB-9 cable connector in the electronics enclosure using the Y-shaped RS232 adapter cable. Turn on the PC, initialize PROCOMM Plus and press any key to enter the terminal mode. Use the ALT-P command to set the PC to "2400, N, 8, 1" to establish the correct communications protocol with the sensor. Place CAPS LOCK to ON.
10. At the DCP, turn the visibility sensor circuit breaker to ON (left) position.

11. Verify that the PC displays the sensor initialization message shown below.

*** VIS VER 37.00 - 6220***

The "6220" refers to the sensor model number.

The "37.00" refers to the firmware version. For this procedure the firmware version should be 37.00 or greater.

12. At the PC, type "VG." The sensor will enter the V mode (Extended Diagnostics) and verify the response:

VPXXXXXXXXPPPP PPPOPP PPP PPPP XXXX XX

The sensor status bytes reported above should be all "P" for pass with the exception of byte 22, which should be "0" or "1." A "1" indicates the "Heater Diagnostics" for the hood and electronics heaters are being used, a "0" indicates they are not. The values marked with "X" are irrelevant to this procedure and should be ignored. If any "P" is reported as an "F", refer to the ASOS Site Maintenance Manual Heater Troubleshooting Procedures, Chapter 6, Table 6.5.6 before proceeding.

13. At the PC type "VF." Enter password EIEIO. Press ENTER until serial number requested. Enter the sensor serial number. Press ENTER until the VF command is completed. Verifying that the correct data is present.

NOTE "DISABLING HEATER DIAGNOSTICS"

After following this procedure the sensor will no longer test individual sensor heaters during routine operation. Remember to place a note in the SYSLOG stating that heater diagnostics have been disabled in the Visibility Sensor. All Heaters must be checked with an Ohm meter every 90 days. Refer to the Heat Diagram (Figure 3). If Heaters fail, replace the appropriate FRU in accordance with the Site Technical Manual S-100.

14. Press Enter until the following question appears:
"Heaters installed?" (Y or N) [Y]>N. The response in this situation is No [N].

The sensor will reply:

"Need password to disable heater diagnostics"

"Password?...==>????" Type Chill (Capital C, lowercase hill)

The sensor will respond with:

"Heater diagnostics disabled."

Press enter until the VF command is completed, verifying that the remaining data is correct.

15. At the PC type "VH". Press enter until the "VH" command is completed, verifying that the correct data is present. Continue to step 7.

TEARDOWN

16. Disconnect the PC DB-9 cable connector from the fiber optic modem and install the DB-9 cable connector removed in step 3.3.
17. Using the large flat-tipped screwdriver, close the visibility sensor electronics enclosure access door and secure.
18. Raise the visibility sensor and install hinge pin.
19. At the DCP, turn the visibility sensor circuit breaker to the ON (left) position.

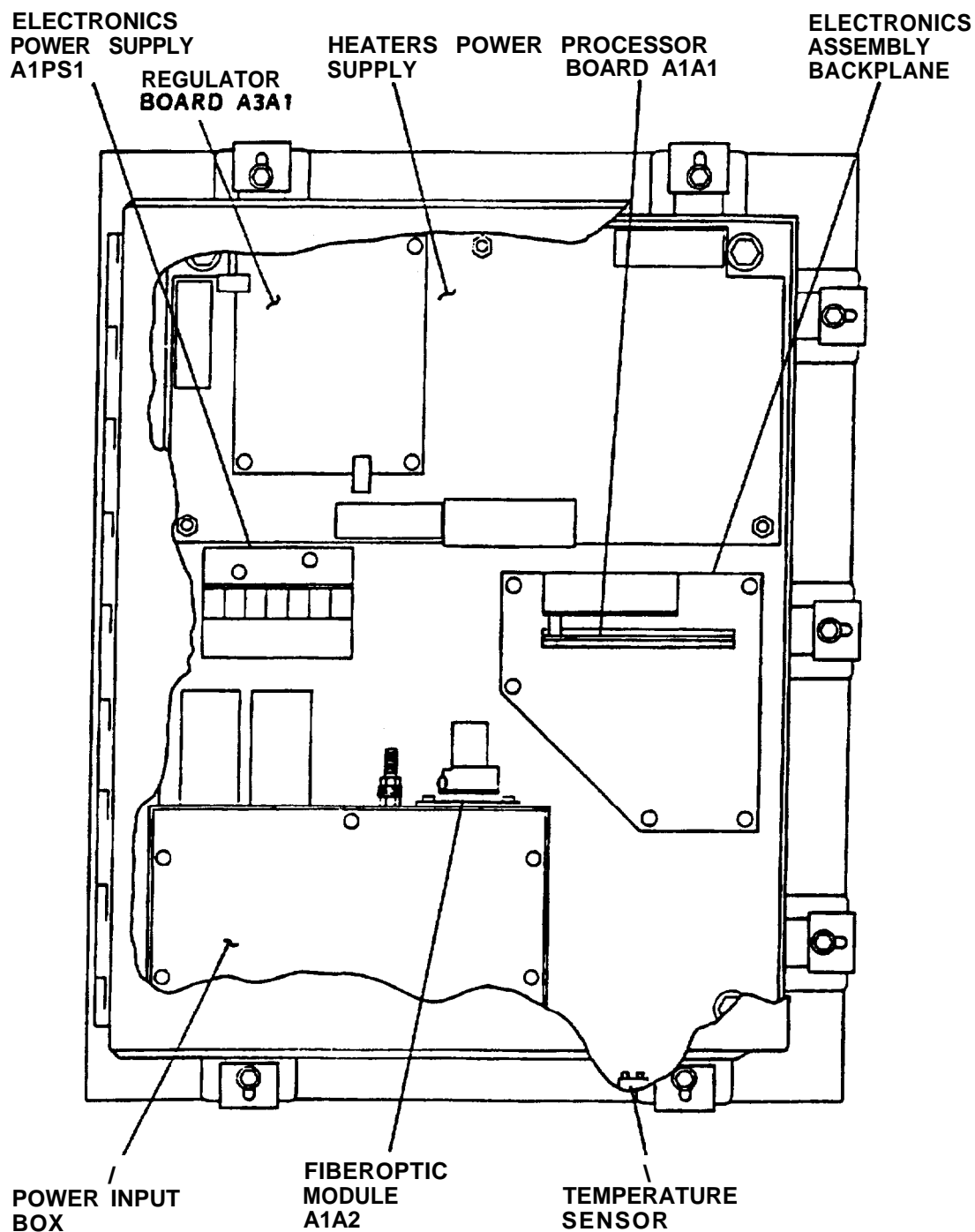
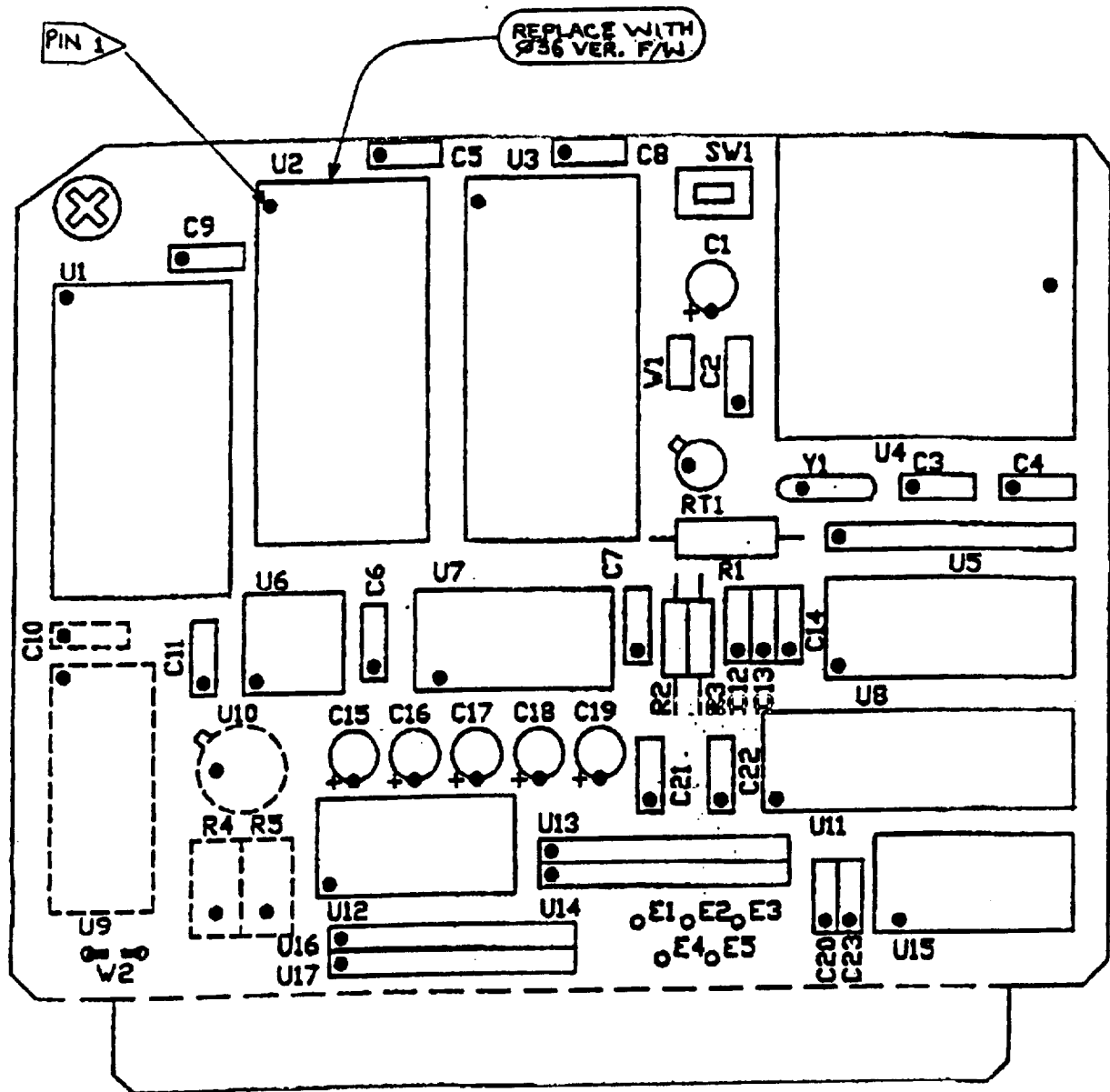


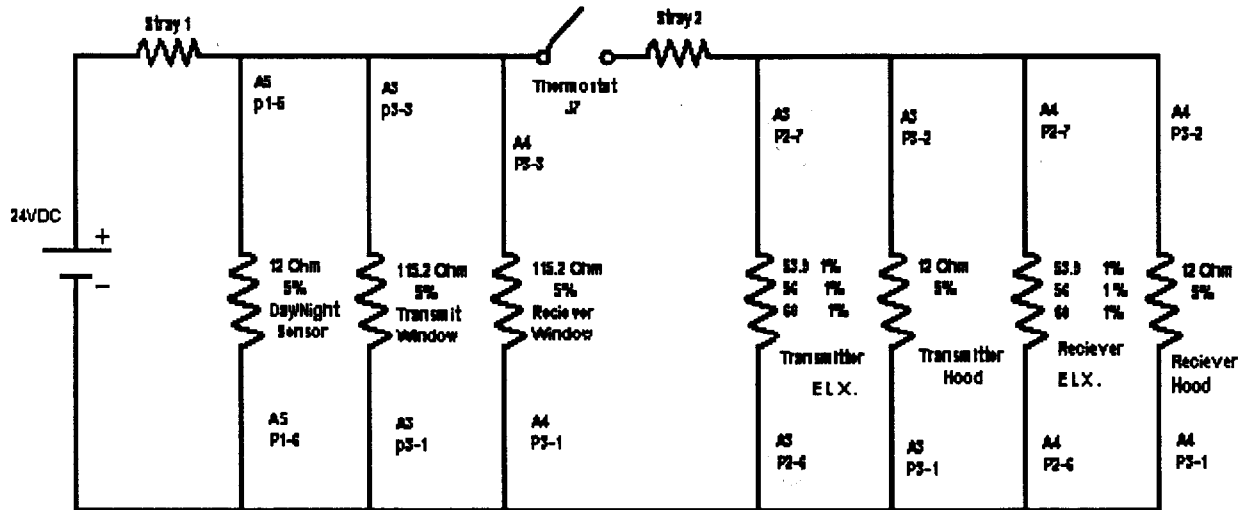
Figure 1 Visibility Sensor Electronics Enclosure



VISIBILITY PROCESSOR BOARD

P/N 32194-1

FIGURE 2



Heater Diagram
Figure 3

INSTRUCTIONS

FIELD MODIFICATION KIT - Visibility Sensor Crossarm P/N 31830

1.0 Prevention of Cables Snagging

1.1 GENERAL

Description of Change:

A stainless steel shield will be inserted into each visibility sensor crossarm housing to restrain the cables from contacting the transmitter and receiver canisters. This will prevent the canisters from snagging the cables during insertion and removal. The intent is to prevent undue stress on the cables and thus improve service life.

1.2 PROCEDURE

Table 2 provides the procedure to remove and install the hood cable guides.

Material Required: 2 each Hood Cable Guides

Table 2. Replacing Visibility Hood Cable Guide

VISIBILITY SENSOR HOOD CABLE GUIDE INSTALLATION PROCEDURE

Tools Required: 15 feet of rope
15/16-inch wrench
No. 1 Phillips screwdriver
Small flat-tipped screwdriver
Seam ripping tool

WARNING

Death or severe injury may result if power is not removed from sensor before performing maintenance activities.

1. Coordinate with site observer, if applicable, and make an entry in the SYSLOG.
2. At the DCP cabinet, set the visibility sensor circuit breaker module to OFF (right) position.
3. Remove the receiver canister from the visibility crossarm in accordance with the Site Technical Manual Chapter 6, Table 6.5.7.

4. Install the hood cable guide as follows:

- a. Shrinkable tubing on the heater wires coming from the window assembly and the signal cables coming through the crossarm must be eliminated from the hood cavity. A seam ripping tool is provided with the retrofit kit for use in stripping the tubing from the wire bundles. With steady pressure, the tool will slit the tubing as it is pressed inward.

Remove all of the tubing from the heater wire bundle.

Remove enough tubing from the signal wire bundle so none remains in the hood cavity; about 1 inch beyond the point where it enters the hood from the crossarm. There is sufficient slack in the bundle to allow it to be pulled far enough into the cavity.

- b. With the tubing removed, the wire bundles can be flattened against the side of the hood. Arrange the wires so the larger heater wires, the green ground wire, and the coax cable are at the bottom as shown in the Figure 4.
 - c. The cable guides are symmetrical, so they will fit in either hood. Holding the wires against the side of the hood, insert the guide so it is positioned between the upper and innermost of the canister slides. You will feel a positive indication that it is captured. Slowly press inward, keeping a slight pulling pressure on the wires to keep them from being snagged by the leading edge of the guide. Some wiggling might be required. The guide has been completely inserted when it bottoms-out against the window assembly.
 - d. The angular shape of the ends of the guides allows the wiring to be reattached to the canister assemblies as usual.
5. Re-install the receiver canister into the crossarm in accordance with the Site Technical Manual Chapter 6, Table 6.5.7.
 6. Remove the transmitter canister from the visibility crossarm in accordance with the Site Technical Manual Chapter 6, Table 6.5.7.
 7. Repeat steps 4a thru 4d.
 8. Re-install the transmitter canister into the crossarm in accordance with the Site Technical Manual Chapter 6, Table 6.5.7.
 9. At the DCP cabinet, set the visibility sensor circuit breaker module to ON (left) position.

VISIBILITY HEAD INSPECTION

See ASOS Site Manual S-100 for removal and installation procedures for the Visibility Receiver (table 6.5.7) and Transmitter (table 6.5.8).

With the Receiver and Transmitter canisters removed from the sensor head, the procedure to inspect for proper solder connection of the internal heater wiring is the same for both units.

1. Use a #1 Phillips screwdriver to remove the three screws located approximately 2.5 inches from the connector end and at approximately 120 degree intervals around the canister.

NOTE: BE EXTREMELY CAREFUL as the internal portion of the canister will freely slide out toward the lens end with these screws removed. Do not allow the optics end of the canister to impact on the work surface.

2. Locate the gold colored heater resistor attached to the rod that runs the length of the canister above the circuit board.
3. Gently tug on both ends of the wires that connect the gold resistor to the circuit board to ensure that the connections are securely soldered and not merely pushed into the terminations. If a loose connection is found, replace the canister.
4. Reverse the disassembly procedure to reassemble the canister. The three retaining screws will only line up with the case in one position. Simply rotate the housing around the internal portion until all screw holes are visible.
5. When it has been verified that the heater wiring is properly soldered, place a small dot of red nail polish near the DB9 connector on the end of the canister to indicate that the unit has been checked and verified.

NOTE: Clean lenses in accordance with the Site Technical Manual Chapter 6, Table 6.5.2 before placing canisters back into sensor head.

NOTES:

1. INTERPRET DRAWING PER DOD-STD. 100
2. WORKMANSHIP PER MIL-STD-45A, REQUIREMENT NO. 9
- ⚠ INSERT CABLE GUIDE AFTER THE WIRES HAVE BEEN ARRANGED IN REAR HOOD (AS SHOWN)

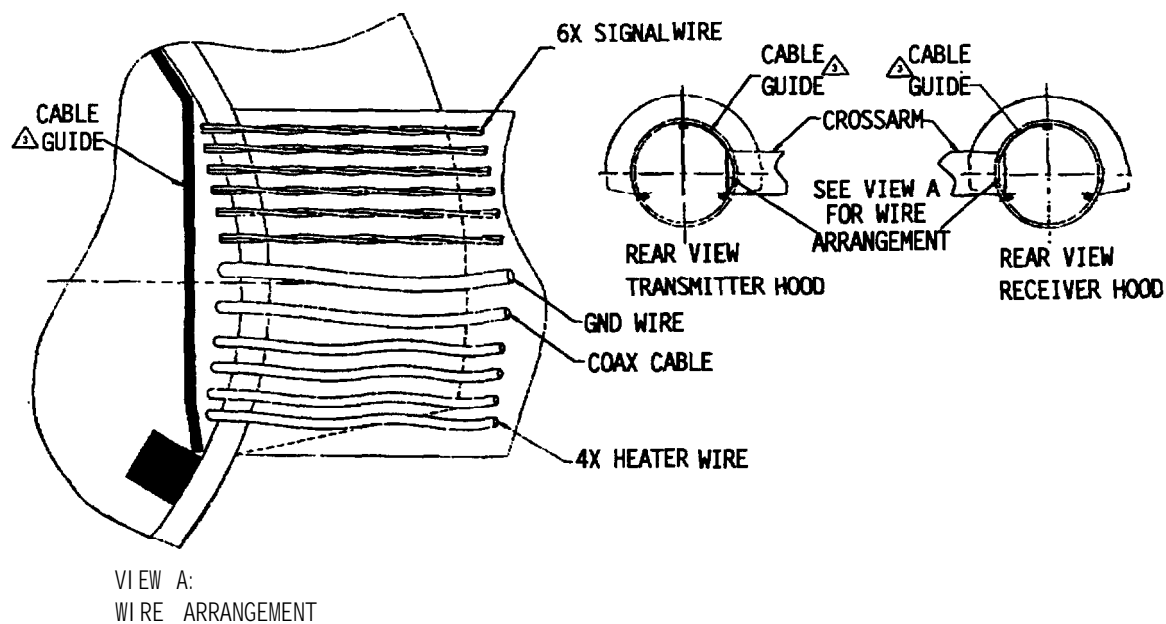


Figure 4

The Visibility Firmware Version 037 was tested at the following sites:

Eastern Region:	ALB	Albany	NY
	BGM	Binghamton	NY
	BUF	Buffalo	NY
	CLE	Cleveland	OH
Southern Region:	ABQ	Albuquerque	N M
	JAN	Jackson	M S
Central Region:	ABR	Aberdeen	SD
	BIS	Bismarck	ND
	CEZ	Cortez	c o
	DVN	Davenport	I A
	FSD	Sioux Falls	SD
	GRB	Green Bay	WI
	IMT	Iron Mountain	MI
	LBF	North Platte	NE
Western Region:	BOI	Boise	ID
	GTF	Great Falls	MT
	HVR	Havre	MT
	SLC	Salt Lake City	UT
Alaska Region	ANC	Anchorage	AK
	OME	Nome	AK

WS HQ USE ONLY		WS FORM A-26 (4/94) Supersedes WS Forms A-23 and WS Form 11-24, which are obsolete.				U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE				Document Number G 49978	
General Information		1. Open Date 10 / 22 / 96	Time 0900	2. Initials MRB	3. Response Priority (check one) <input type="radio"/> Immediate <input checked="" type="radio"/> Routine <input type="radio"/> Not Applicable	4. Close Date 10 / 22 / 96	Time 1100				
5. Description MODIFY VISIBILITY SENSOR (AVIS) I.A.W. MOD NOTE 37											
Equipment Information		6. Station ID THV	7. Equipment Code AVIS	8. Serial Number A0267	9. TM M	10. AT M	11. How Mal. 999				
1.2. EQUIPMENT OPERATIONAL STATUS TIMES		a. Fully Operational <input type="checkbox"/>	b. Logistics Delay <input type="checkbox"/>	c. All Other <input type="checkbox"/>	d. Logistics Delay <input type="checkbox"/>	Not Operational <input type="checkbox"/>		e. All Other <input type="checkbox"/>		2:00	
14. Work Load Information											
Block #	ASN	b.	NSN	c.	TM	d. AT	e. How Mal.	f. Qty.	g. Maint. Hrs.	Type	Staff Hrs.
1										a. Routine	
2										b. Non-routine	
3										c. Travel	
4										d. Misc.	002:00
5										e. Overtime	
15. Maintenance Comments INSTALLED FIRMWARE VERSION 037 AND VISIBILITY CROSSARM CABLE GUIDES											
Miscellaneous Information		16. Initials MRB									
17. SPECIAL PURPOSE REPORTING		a. Mod. No. 37	b. Mod./Act./Deact. Date 10/22/96	c.	d.	e.					
18. CONFIGURATION MGMT. REPORTING (see as directed)		a. Block #	b. Manufacturer's Part No. of New Part		c. Revision No. of New Part						

Appendix E

Eastern Region

7MY	ACY	AQW	BFD	BUY	CAK	CEU	CLE	CQX	CUB	CVG	DKK
DSV	ELZ	ERI	FIT	FOK	GED	HFD	HVN	HWV	IJD	ILG	IPT
LBT	MEB	MGJ	MRH	N00	N22	N63	N80	OFP	OGB	ORE	PLB
PTW	PYM	RZZ	SEG	SLK	TAN	TDZ	THV	W52	YNG		

Southern Region

21A	39J	81J	AGS	AHN	AMA	ATL	ATL	BFM	BKV	BVO	CDS
CSG	CSM	DAB	DHT	DNL	F90	FDR	GIF	GOK	GVL	HBG	HBR
HKA	HSV	JAN	LAW	LEE	M50	M76	MCN	MC0	MC0	MGM	MKO
MLC	MTH	PGD	PNC	PWA	ROW	SAT	SWO	TRI	TUP	TYS	X41

Central Region

3SM	ADG	AIA	AK0	ALS	ASX	BDE	BEH	BIS	BPI	BRD	BYG
C19	CAG	COS	DEN	DGW	DSM	EEO	ENW	EVW	FFT	FLD	FOE
FSD	GEY	GLD	GLR	GRI	GSH	HEI	HIB	HSI	HYR	ICT	IEN
IMT	ISW	IXD	JKL	LAA	LBF	LHX	LIC	LNK	MCK	MFI	MTJ
NED	OJC	OVS	PKD	PPF	PUB	RAC	RAP	RHI	RIL	SBM	SGF
SNY	SPI	SUX	SUX	TOP	TOR	TQE	WLD				

Western Region

1S4	3S2	AVX	BFL	BHK	BNO	CLM	DLN	ELN	EUG	FCA	FHR
GEG	GTF	HLN	LGB	LVM	LWS	MAE	MHS	MLP	MMV	MS0	045
OLF	OMK	ONO	OVE	PHX	PUW	RBG	SCK	SDM	SMF	SMX	U11
U73	WVI	YKM									

Alaska Region

A8L	BTT	CDB	FAI	JNU	KAL	MCG	MRI	SNP	TKA	YAK	
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Additional Information to Modification Note 37 Dated February 5, 1997

General:

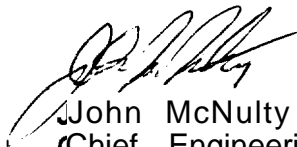
Errata sheet number 1 provides instructions to correct EHB-11, Section 3.6, Modification Note 37, Appendix A pages A-2 and A-6. The reason for the change is to correct information learned after Modification Note 37 was published.

Procedure:

1. Remove the following information from line 15 by marking through Continue to step 7.
2. Make the following pen-ink changes to the heater diagram on page A-6. Change P2-7 to P2-5 and P2-6 to P2-4. ^{A3}

Effect on Other Instructions:

Volume 2, EHB-11, Section 3.6, Pages A-2 and A-6 of Modification Note 37.



John McNulty
Chief, Engineering Division

ASOS MODIFICATION NOTE 38 (for Electronics Technicians)

Engineering Division

W/OSO321:BGM/AJW

SUBJECT	ACU Memory Firmware Version 2.49 DCP Boot EPROMs Version 1.80
PURPOSE	Firmware Upgrade for ASOS Operational Load.
EQUIPMENT AFFECTED	ASOS Acquisition Control Unit (AACU) ASOS Data Collection Package (ADCP)
PARTS REQUIRED	ACU Memory Microcircuit P/N 62828-45002-1 ACU Memory Microcircuit P/N 62828-45003-1 ACU Memory Microcircuit P/N 62828-45004-1 ACU Memory Microcircuit P/N 62828-45005-1 DCP Microcircuit P/N 62828-45018-1 DCP Microcircuit P/N 62828-45019-1 I/O panel feed through adapter DB-25 (As required for 1A9J42) RS-422 adapter (As required)
MOD PROCUREMENT :	The above parts are available through NLSC and are required at commissioned sites as listed in Appendix D. Return old EPROMs to NRC. ASOS technicians will need to order ACU EPROMs S100-1A2A3-U8C, DCP EPROMs S100-2A1A2A1U29, I/O panel feed through adapter S100-1A9J22 and an RS-422 adapter S100-1A9W77 as described in Appendix D.
SPECIAL TOOLS : REQUIRED	IC insertion tool (ASN: 041-T-13) IC extraction tool (ASN: 041-T-16) Conductive foam Electrostatic discharge (ESD) straps
TIME REQUIRED :	2 hours
EFFECT ON OTHER : INSTRUCTIONS	EHB - 11, Section 3.6, this modification note supersedes Modification Note 33, Modification Note 20, including errata, Modification Note 31 and Modification 14.
AUTHORIZATION :	This modification is authorized by ECP E96-SM05F199.
VERIFICATION : STATEMENT	This modification has been tested for operational integrity at the sites listed in Appendix B and the OSO test facility in, Sterling, VA.

GENERAL

This modification note provides procedures to upgrade the ASOS software by removing and replacing erasable programmable read only memory (EPROM) on the ACU memory board and each DCP CPU. This change adds the temperature probe monitoring for the pressure sensors in Single Cabinet Assemblies (SCA), next generation runway visibility range (NGRVR) processing, thunderstorm sensor processing and warm starts in systems configured with ACE. This note provides procedures for "Before Installing Firmware" and "After Installing Firmware."

PROCEDURE

The following installation instructions are for EPROMs U8, U7, U17, and U21, on the ACU memory board 1A2A3. Installation instructions are included for EPROMs U29 and U30 on the DCP memory board(s) 2A1A2A1 (and 2A1A2A2 if installed). Additionally instructions for installing the RS-422 connector on the ACU I/O (1A9J42) connector panel and the RS-422 adapter cable (1A9W1) are included.

CAUTION

Be careful to protect the electronics on the ACU memory DCP CPU boards during this procedure. Do not reconfigure any jumpers on the ACU memory or DCP CPU boards unless instructed.

BEFORE INSTALLING FIRMWARE

1. Call the AOMC at 1-800-242-8194 and provide notification on which ASOS you will be installing new ACU and DCP firmware. Confirm that the AOMC will provide access to the site-specific data base. Coordinate with the AOMC that the data base is available. Upload the current configuration before installing the new firmware.
2. Get approval of the responsible MIC/OIC before starting installation. You may install on any day of the month if restrictions in steps 3 and 4 are satisfied.
3. Commissioned Sites Only: Do not start installation during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of these conditions are expected within 3 hours. The responsible MIC/OIC will define these meteorological conditions.
4. Do not start firmware installation at a time that will conflict with scheduled synoptic-observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Although one (1) hour should be sufficient, allow 2 hours to complete installation and restart ASOS.
5. Immediately before beginning work at NWS staffed sites, the MIC/OIC will inform the tower and any other critical users that ASOS will be shut off for a firmware upgrade. At an unstaffed site, the el tech will inform the tower using Controller Video Displays (CVD) and Operator Interface Devices (OID) to log off and shut down display power to avoid confusion.

NOTE

Commissioned sites only are to download the following data to the laptop using the direct command mode: 5-minute data (12 hrs.), SYSLOG information (24 hrs.), SHEF messages (24 hrs.), and any 2-hour archive files. Forward collected data to the responsible DAPM.

6. Do not begin the installation process (i.e., halt ASOS) until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.
7. Go into the AOMC page (REVUE-SITE-VERSN-AOMC); wait for the external communication and the site physical lines to change from "UPLOAD REQ" to "COMPLETE" before going to the next step. Disable all hardware and dial communication ports to AFOS (REVUE-SITE-CONFIG-COMMS). The system voice function will automatically broadcast a "not available" message when the ACU power is turned off.
8. Make the appropriate SYSLOG entries (MAINT-ACT-FMK) Mod 38
 - a. Log on as **TECH**;
 - b. Key the **MAINT** screen;
 - c. Key the **ACT** page;
 - d. Key **START** - Stop here and perform Mod 38. As described in Appendix "A"; and upon completion of the Mod 38, log onto the system.

AFTER INSTALLING FIRMWARE

See below, in Step 11, for a description of the time required to reboot ASOS and sensor response time after a new firmware load.

9. When ASOS is restarted at unstaffed sites, call to inform towers using CVDs and OIDs to turn on their displays. (At staffed sites, the MIC/OIC will call the tower.)
10. If on-site NWS staff provides backup while the installation is underway, no special observation is needed when ASOS is restarted. Proceed to step 11.

If there is no backup at a site and a record observation was missed during the installation, a special observation must be taken when ASOS is restarted. The el tech should take the following steps at the ASOS keyboard after installation:

- a. Press [SIGN];
- b. Type his/her initials and press [RETURN];
- c. Type the observer level password and press [RETURN];
- d. Press [GENOB];
- e. Press [SPECL];
- f. Press [EXIT];
- g. Press [SIGN];
- h. Type his/her initials again and press [RETURN];
- i. Press [RETURN] twice. This signs the "observer" off ASOS; and
- j. Leave ASOS running.

Note: The observer must sign off before the 5-minute edit time is up.

11. Inform the office staff that ASOS is again operational. If less than 25 minutes remain until the next hourly observation, augmentation of the ceiling may be required. Augmenting several elements may be necessary (or even the entire observation). The chart below indicates how long it takes after a startup for ASOS to report each observation element automatically.

Times Needed for Elements to be Reported Automatically

	<u>Minimum</u>	<u>Maximum</u>
Pressure	60 seconds	10 minutes
Precipitation Amount	60 seconds	•
Wind direction	2 minutes	7 minutes
Windspeed	2 minutes	7 minutes
Precipitation Type.....	2 minutes*	
Temperature	5 minutes	10 minutes
Dew Point	5 minutes	10 minutes
Visibility	10 minutes	15 minutes
Obstruction to Visibility	10 minutes	*
Ceiling	30 minutes	35 minutes

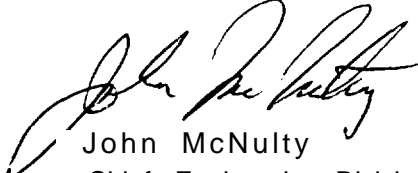
* Maximum time not applicable since phenomena may not be present. Minimum time applies if phenomena are present.

12. Verify that ASOS transmitted an hourly observation. Call the AOMC at 1-800-242-81 94 and tell the operator:
 - a. Your location;
 - b. That installation of the new firmware has been completed; and
 - c. That ASOS is operational.
13. Enter in the SYSLOG that maintenance has been completed.
 - a. Key the **MAINT** screen;
 - b. Key the **ACT** page;
 - c. Key **FMK** - Enter the Field Mod Kit (FMK) number as follows: **Mod 38**;
On the second line of the screen verify that only **Mod 38** is displayed. Complete by entering Y in the Y/N area if only **Mod 38** is displayed. If other modifications are completed, make appropriate log entry;
 - d. Check the **SYSLOG** and verify the **FMK** message. Enter a comment in the SYSLOG stating that version 2.49 for the ACU and version 1.80 for the DCP has been installed; and
 - e. Notify the AOMC via telephone that Mod 38, Firmware v2.49 / v1.80 has been completed.
14. At an expansion site with ATCT, the el tech will contact the ATCT and supply information on the following:
 - a. ASOS maintenance is completed;
 - b. ASOS is restored to service; and
 - c. Tower CVDs and OIDs need to be turned on, and TRACON displays need to be turned on.
15. Return Removed Parts. Parts removed (EPROMs) should be properly packed and returned to NRC and marked as S100-FMK015.OLD.

Reporting Modification

Target date for completion of this modification is outlined in appendix D. Report completed modification on a Weather Service Form A-26 maintenance record. Follow instructions in EHB-4, Part 2, Appendix F, using reporting code AACU. Add in the comment field that version 2.49, version 1.80, J45 connector and the RS-422 adapter cables were installed. Please ensure that the serial number recorded in Block 8 reflects the most up to date information.

Also, record the modification number in block 17 (A) as 38 (see Appendix C for a completed sample of WS Form A-26).



John McNulty
Chief, Engineering Division

Appendix A
Appendix B
Appendix C
Appendix D

INSTRUCTIONS

FIELD MODIFICATION KIT - ASOS SOFTWARE VERSION UPGRADE

1. UPGRADING ASOS SOFTWARE

1.1 GENERAL

All ASOS application software is contained on the four erasable programmable read only memory (EPROM) integrated circuits (IC) on ACU memory board 1A2A3 or SCA 7A1A1A2A3 memory board. Figure 1 illustrates the ACU memory board and identifies the four EPROMs (U8, U17, U7, and U21) to be replaced. Figure 2 illustrates the DCP memory board 2A1A2A1 and/or 2A1A2A2 and identifies the two EPROMs (U29 and U30) to be replaced. The EPROMs are 32-pin dual in-line package (DIP) CMOS devices, each providing 512K x 8 bits of storage. Upgrading ASOS software requires only replacing the four EPROMs on the ACU memory board with higher revision level ICs.

The four EPROMs on the ACU memory board or SCA Memory board contain both the ACU application program and the DCP application program. The CPU runs the application program directly from the ACU memory board or the SCA memory board. The DCP application program must first be downloaded from the ACU memory board or SCA memory board to RAM storage in the DCP before it can be run by the DCP CPU.

Sites without a local OID (i.e., no RS232 connected for the primary OID) should attach a terminal to the primary OID port of the ACU 1A9J22 or the SCA 1A9J19 before proceeding.

1.2 SOFTWARE UPGRADE PROCEDURE

This procedure provides instructions to upgrade ASOS software by removing and replacing the EPROMs. The procedure starts with the DCP and then advances to the ACU. After new EPROMs are installed, this procedure cold starts both the ACU (or SCA) and associated DCPs.

If the ACU EPROMs in the system are 1.70 or higher, the ACU is no longer cold started by removing battery jumper J22 (Figure 1) to clear all RAM on the board. The next step requires receiving a download of site-specific data from the AOMC. The DCPs are cold started by performing a hard reset of each DCP from the processor status page on the OID. After completion of the upgrade procedure, the EPROMs removed from the ACU and DCP boards should be packaged in appropriate electrostatic discharge (ESD) protective material for return to NRC.

Note: There may be an approximate 20-minute wait required to access the AOMC.

DCP EPROM Installation:

Step

1. If there is more than one DCP at the site, each DCP must receive this modification.

CAUTION

Damage to equipment may result if power is not removed prior to removal or installation. Ensure that OUTPUT POWER switch is set to 0 (OFF) and facility power is removed.

To avoid damage to circuit boards and integrated circuits, use proper ESD handling procedures, including using a grounding strap when performing the following steps.

2. Set OUTPUT POWER switch on UPS status panel to the 0 (OFF) position. The indicator for the OUTPUT status panel extinguishes. (This step is only required on systems with a UPS).
3. Remove facility AC power from DCP cabinet by turning off the circuit breakers in the AC Junction Box or turning off the Facility Disconnect Box.
4. Remove the radio cable(s) from the JK1 connector on the front of the CPU board located in 2A1A2A1 (and 2A1A2A2 if installed).
5. Using a small flat blade screwdriver, loosen captive screws located at top and bottom of the DCP CPU board(s) 2A1A2A1 (and 2A1A2A2 if installed).
6. Press extractor handles at top and bottom of DCP CPU boards 2A1A2A1 (2A1A2A2 if required) in opposite directions to release board. Remove board from rack.

CAUTION

Throughout this procedure, discharge the screwdriver before and during use by touching tool to the grounded chassis surface. Failure to comply may result in damage to the integrated circuits.

NOTE: A supply of IC extraction and insertion tools has been placed in stock for the ETs to purchase. They are located in the miscellaneous tools and supplies section of EHB-1.

7. Using an integrated circuit IC extractor, remove U29 and U30 from the DCP CPU printed circuit boards 2A1A2A1 (and 2A1A2A2 if installed). Place the removed integrated circuits in a conductive foam or on some other static-free surface.

8. Remove the new EPROM ICs from the protective package and insert them into the DCP CPU board sockets in accordance with the following chart. Ensure that the EPROMs are installed with pin 1 (as identified by notch in top of IC) oriented toward board connector P1 and P2 as shown on Figure 1.

<u>IC socket</u>	<u>IC part number</u>
U29	62828-45018-1 Version 1.80
U30	62828-45019-1 Version 1.80

9. Hold the DCP CPU board by the handles, position the board with the component side facing to the right and carefully slide the board into the card rack on its guides. Align the board with the rear connector and press into place.
10. Use a small flat blade screwdriver, and tighten the captive screws located at the top and bottom of the DCP CPU board.
11. Connect the radio cables removed in step 4 to the CPU cards at JK1 . Observe marking on cables to ensure proper connection.
12. Apply facility AC power from DCP cabinet.
13. Set OUTPUT POWER switch on UPS status panel to the 1 (ON) position. The indicator for the OUTPUT status panel lites. (This step is only required on systems with a UPS).
14. If there is more than one (1) DCP at the site, each DCP must receive this modification.
15. Proceed with the ACU EPROM installation.

ACU EPROM Installation:

Step

1. If the printer is on-line, place it off-line by pressing the **ON-LINE** switch located on the printer front panel.

CAUTION

Damage to equipment may result if power is not removed prior to removal or installation. Ensure that OUTPUT POWER switch is set to 0 (OFF) and facility power is removed.

To avoid damage to circuit boards and integrated circuits, use proper ESD handling procedures, including using a grounding strap when performing the following steps.

2. Set the OUTPUT POWER switch on UPS status panel to the 0 (**OFF**) position. The indicator for the OUTPUT status panel extinguishes. (This step is only required on systems with a UPS).

3. Remove facility AC power from ACU or SCA cabinet.
4. Using a small flat blade screwdriver, loosen the captive screws located at top and bottom of blank panel located in the ACU at 1A2A4 or in the SCA at 7A1A1A2A4. This panel must be removed before removing memory board in slot 1A2A3 or 7A1A1A2A3 to avoid damage to IC. on the memory card.
5. Using small flat-tipped screwdriver, loosen captive screws located at top and bottom of ACU memory board 1A2A3 or SCA memory board 7A1A1A2A3.
6. Press extractor handles at top and bottom of memory board 1A2A3 or 7A1A1A2A3 in opposite directions to release board. Remove board from rack.
7. On the underside of the memory board, using a flat blade screwdriver, remove three screws and flat washers securing front panel to board. Remove board from front panel.

CAUTION

Throughout this procedure, discharge the screwdriver before and during use by touching tool to the grounded chassis surface. Failure to comply may result in damage to the integrated circuits.

Lift integrated circuit as evenly as possible. Failure to comply may result in damage to integrated circuits.

8. Use an IC extraction tool to remove U7 from the front of the board slide. Carefully lift up on U7 to remove it from the socket as evenly as possible. After U7 is removed from the socket, place in a conductive foam or on some other static-free surface. See note page A2 for instructions on obtaining IC extraction/insertion tools.
9. Repeat Step 8 for removal of the following integrated circuits U8, U17 and U21.

CAUTION

The ACU memory board has a battery that keeps voltage on the RAM sockets. **DO NOT** use a metal insertion tool when installing the RAM ICs. Avoid shorting out the voltage and ground pins. Shorting out the voltage pin will corrupt any stored data and is similar to performing a cold boot.

10. Remove the new EPROM ICs from the protective package and insert them into the memory board sockets in accordance with the following chart. Ensure that the EPROMs are installed with pin 1 (as identified by notch in top of IC) oriented toward board connector P1 and P2 as shown on Figure 1.

<u>IC socket</u>	<u>IC part number</u>
U 8	62828-45002-1
U17	62828-45003-1
U 7	62828-45004-1
U21	62828-45005-1

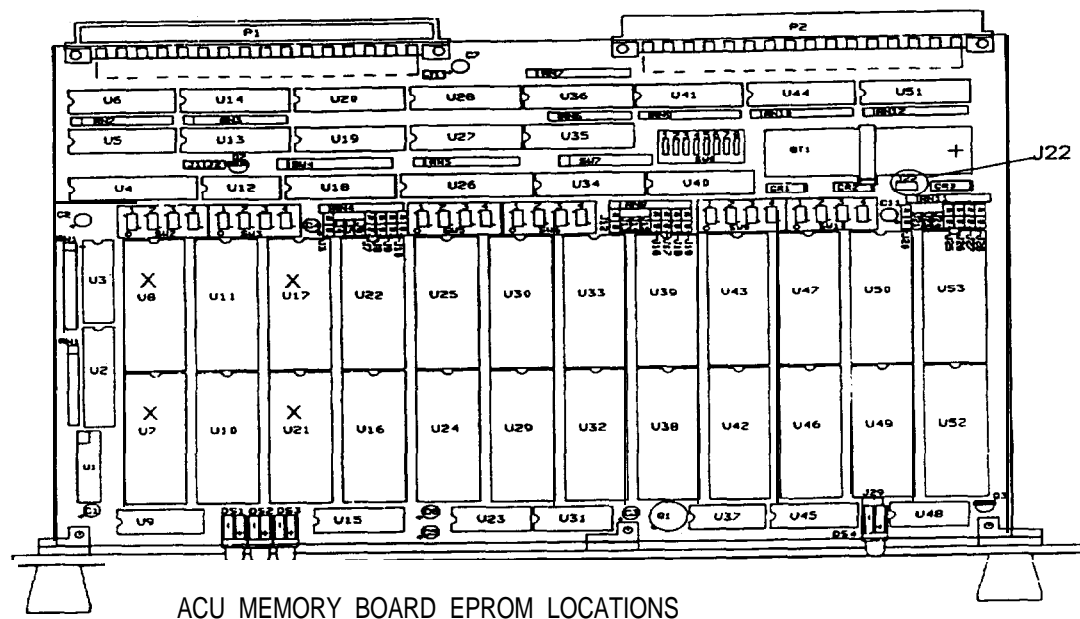
11. Use a small flat blade screwdriver, and install the three flat washers and screws. This will secure the front panel to the board.
12. Hold the ACU memory board by handles, position the board with the component side facing to the right and carefully slide board into VME slot 1A2A3 or SCA slot 7A1A1A2A3. Align the board with the rear connector and press into place. Reinstall the ACU 1A2A4 board or SCA 7A1A1A2A4 blank panel.
13. Use a small flat blade screwdriver and tighten the captive screws located at top and bottom of boards and blank panels.
14. Sites identified in appendix D requiring NGRVR must complete this step. Verify that J42 has been installed on the ACU I/O panel. If J42 is not installed, remove the J42 connector cover and save the hardware. Install connector S100-1A9J22 using the removed hardware. For ACUs with serial numbers less than 289 must install RS-422 cable adapter, S100-1A9W1 on the inside of the J42 connector. This cable corrects a wiring error in the SIO cable harness. Connect P18 of the cable harness to J42 or the cable adapter as appropriate.
15. Apply facility power to ACU cabinet. Set OUTPUT POWER switch to 1 (**ON**) position. (This step is not required for systems that do not have a UPS).
16. After the power is applied to the ACU, one of the PASS (Green) LEDs on the CPU should illuminate and the PASS LED on the other CPU will remain off. After approximately 1 minute, the LED that was off should start blinking.
17. Place the line printer on-line by pressing the **ON-LINE** switch located on the printer front panel. The **ON-LINE** indicator illuminates.
18. With the power applied to the ACU and OID and after a brief warmup delay, the OID displays 1-minute data. If the display is not being updated, press the HELP key twice to refresh screen. The NEED SID AND AOMC PHONE message appears at top of screen. If this does not occur, return to REMOVAL procedure, step 1. Follow the steps until the ACU memory board is removed. Ensure the ACU EPROMs are installed correctly. Follow the INSTALLATION procedures to replace the ACU memory board.
19. At the OID, sign onto system as a Technician. Note: Passwords are reset to the default values.
20. Display the external communications page on the OID (sequentially press REVUE-SITE-CO-NFG-EXTRN keys from the 1-minute display). Enter both AOMC phone numbers (1-800-253-4717 & 1-800-434-1133) into the AOMC PHONE NUMBER field and press the EXIT function key.

21. Display the site physical page on the OID (sequentially press REVUE-SITE-PHYS function keys from 1-minute display). Enter the three or four character SID code in the STATION IDENTIFIER field and press the EXIT function key. The system then calls the AOMC and receives a download of site-specific data.
22. Display the AOMC version page on the OID (sequentially press REVUE-SITE-VERSN-AOMC function keys from 1-minute display). This will allow you to observe that all the files are being downloaded from the AOMC. All status fields should read "COMPLETE" in approximately 5 minutes. Press EXIT.

NOTE: The following steps cold start the DCPs.

23. Display the maintenance page on the OID (press the MAINT function key from 1-minute display).
24. Use the PREV/NEXT keys, position the cursor over PROC field and press the SEL key. The OID displays the processor status page.
25. Use the PREV/NEXT keys, position the cursor over DCP #1 - HARD field and press the RESET key. Respond "YES" and "ENTER" to the "ARE YOU SURE?" message. The corresponding status field displays INITIALIZING while the unit is initializing. The progress of the download can be monitored by the PERCENT COMPLETE message that appears at the top of the screen. When the percent complete reaches 100, the DCP status field changes to RUNNING in a single DCP configuration.
26. If the system contains more than one DCP, repeat step 25 for DCPs #2 and #3 as required. Once all the DCPs have been completed, the DCP status field will change to RUNNING. If the DCP status does not change to running or sensor data is not being returned from the DCP, it will be necessary to pull the battery jumper on each DCP memory board.
27. Configure the NGRVR on SIO board 1 (RS-422) port 3 for those sites identified in appendix D. From the 1 minute page, key REVIEW, SITE, CONFIG, COMMS and configure SIO board 1 port 3 as RVR. Set the following parameters: ENABLE, 2400, EVEN, 7, 1, NONE, HARDWARE.
28. After the modification has been completed, clear any maintenance flags that occur as a result of the restart.
29. Display the software version page on the OID (sequentially press REVUE-SITE-VERSN-SW function keys from 1-minute display). The following fields should display version 2.49: MEMORY ACU APPLICATION EPROM, MEMORY DCP APPLICATION EPROM, and MEMORY DCP APPLICATION RAM. The PSOS field should display 1.80 for the DCP. These fields may take 5-10 minutes before the display is updated.
30. Upload site configuration to the AOMC. Go into the AOMC page (REVUE-SITE-VERSN-AOMC) wait for all the lines to change from "UPLOAD REQ" to "COMPLETE."
31. Verify that the system time and date are correct. Two or three hours after installation, dial into the system and verify that the system date and time are correct.

ASSEMBLY DRAWING

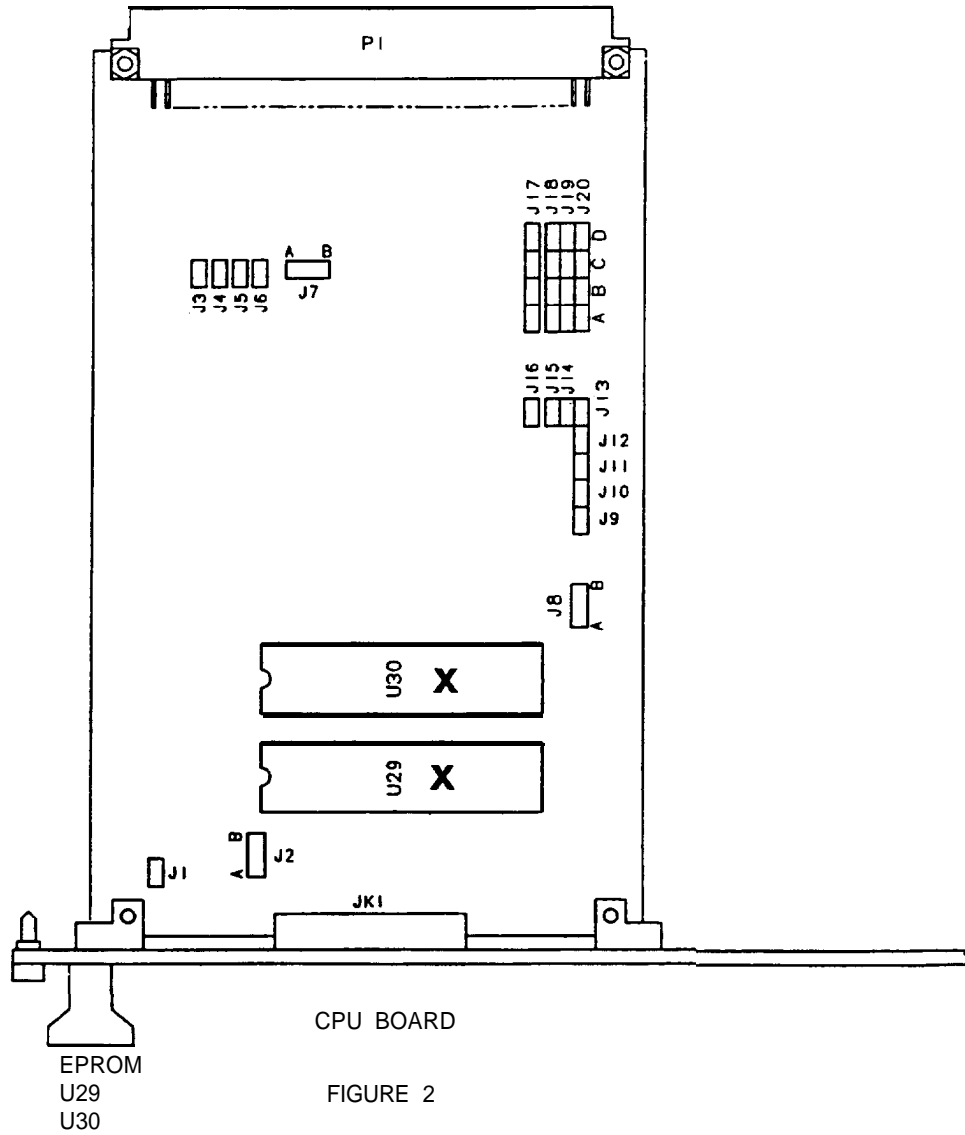


ACU MEMORY BOARD EPROM LOCATIONS

FIGURE 1

EPROM
U7
U8
U17
U21

ASSEMBLY DRAWING



The Test Sites for Firmware version 2.49 are:

S I D	CITY	STATE	AIRPORT
BFF	Scottsbluff	NE	Heilig Field
CNK	Concordia	KS	Blosser Municipal Airport
DCA	Washington, DC	DC	Washington National Airport
HON	Huron	SD	Huron Regional Airport
MIA	Miami	FL	Maimi Internation Airport
MCI	Kansas City	MO	Kansas City International Airport
OFK	Norfolk	NE	Stefan Memorial Airport
OKC	Oklahoma City	OK	Will Rogers World Airport
PWA	Oklahoma City	OK	Wiley Post Airport
SPS	Wichita Falls	TX	Sheppard Air Force Base
TUP	Tupelo	MS	Tupelo Municipal - Lemons Airport
VCT	Victoria	TX	Victoria Regional Airport

Sample of A-26

WS HQ USE ONLY	WS FORM A-26 (4/94) <small>Supersedes WS Form A-23 and WS Form H-28, which are obsolete</small>				<small>U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE</small>		Document Number <div style="font-size: 1.5em; font-weight: bold; text-align: center;">G 49978</div>		
ENGINEERING MANAGEMENT REPORTING SYSTEM MAINTENANCE RECORD									
General Information	1. Open Date 07 / 08 / 97	Time 0900	2. Initials MRB	3. Response Priority (check one) <input type="radio"/> Immediate <input type="radio"/> Low <input type="radio"/> Routine <input checked="" type="radio"/> Not Applicable		4. Close Date Time 07 / 08 / 97 1100			
5. Description <div style="text-align: center; font-size: 1.2em; font-weight: bold;">PERFORM MODIFICATION TO THE ACU AND DCP I.A.W. MOD NOTE 38</div>									
Equipment Information	6. Station ID CNK	7. Equipment Code AACU	8. Serial Number 000022		9. TM M	10. AT M	11. How Mal. 999		
12. EQUIPMENT OPERATIONAL STATUS TIMES	a. Fully Operational <div style="border: 1px solid black; height: 20px; width: 80px;"></div>	b. Logistics Delay <div style="border: 1px solid black; height: 20px; width: 80px;"></div>	Partly Operational		c. All Other <div style="border: 1px solid black; height: 20px; width: 80px;"></div>	d. Logistics Delay Not Operational <div style="border: 1px solid black; height: 20px; width: 80px;"></div>		e. All Other <div style="border: 1px solid black; height: 20px; width: 80px; text-align: center;">2:00</div>	
13. Parts Failure Information							14. Work Load Information		
Block #	a. ASN	b. NSN	c. TM	d. AT	e. How Mal.	f. Qty.	g. Maint. Hrs.	Type	Staff Hrs
1								a. Routine	
2								b. Non-routine	
3								c. Travel	
4								d. Misc.	02:00
5								e. Overtime	
15. Maintenance Comments		INSTALLED ACU FIRMWARE VERSION 2.47, DCP BOOT EPROMS VERSION 1.80, J45 CONNECTOR AND THE RS-422 ADAPTER CABLES						16. Initials MRB	
17. SPECIAL PURPOSE REPORTING		a. Mod. No. 38	b. Mod./Act./Deact. Date 07/08/97	c.		d.		e.	
18. CONFIGURATION MGMT. REPORTING (use as directed)		a. Block #		b. Manufacturer's Part No. of New Part				c. Revision No. of New Part	

ASOS ACU Version 2.49 Sites

SID	CITY / STATE	REQUIREMENT	ORDER S100-1A9W1	ORDER S100-1A9J22	INSTALLATION DATE
ALB	Albany, NY	EDITA	N/A	N/A	September 1997
ALS	Alamosa, CO	TSTM	N/A	N/A	September 1997
APN	Alpena, MI	TSTM	N/A	N/A	September 1997
AST	Astoria, OR	TSTM	N/A	N/A	September 1997
ATL	Hartsfield Atlanta, GA	NGRVR	REQUIRED	REQUIRED	August 15, 1997
BDL	Hartford, CT	EDITA	N/A	N/A	September 1997
BFF	Scottsbluff, NE	TSTM	N/A	N/A	Completed
BIL	Billings, MT	EDITB	N/A	N/A	September 1997
BKW	Beckley, WV	TSTM	N/A	N/A	September 1997
BNA	Nashville, TN	NGRVR	N/A	REQUIRED	August 15, 1997
BOS	Boston, Ma	EDITA	N/A	N/A	September 1997
BTR	Baton Rouge, La	EDITB	N/A	N/A	September 1997
BWI	Baltimore, MD	EDITA	N/A	N/A	September 1997
CAK	Akron, OH	EDITA	N/A	N/A	September 1997
CAR	Caribou, ME	TSTM	N/A	N/A	September 1997
CHA	Chattanooga, TN	EDITB	N/A	N / A	September 1997

CLE	Cleveland-Hopkins, OH	NGRVR	N/A	REQUIRED	August 15, 1997
CLT	Charlotte, NC	EDITA	N/A	N/A	September 1997
CMH	Columbus, OH	EDITA	N/A	N/A	September 1997
CNK	Concordia, KS	TSTM	N/A	N/A	Completed
CON	Concord, NH	TSTM	N/A	N/A	September 1997
COS	Colorado Springs, CO	EDITB	N/A	N/A	September 1997
CRW	Yeager, Charleston, WV	NGRVR	N/A	REQUIRED	August 15, 1997
CVG	Cincinnati, OH	EDITA	N/A	N/A	September 1997
DAB	Daytona Beach, FL	EDITB	N/A	N/A	September 1997
DAY	Cox Dayton, OH	NGRVR	N/A	REQUIRED	August 35, 1997
DEN	New Denver, CO	NGRVR	N/A	N/A	August 15, 1997
DFW	Dallas/Ft. Worth, TX	NGRVR/ACE	N/A	REQUIRED	August 15, 1997
DSM	Des Moines, IA	EDITA	N/A	N/A	September 1997
DTW	Detroit Metro, MI	NGRVR	REQUIRED	N/A	August 15, 1997
EKN	Elkins, WV	TSTM	N/A	N/A	September 1997
ELP	El Paso, TX	EDITB	N/A	N/A	September 1997
ELY	Ely, NV	TSTM	N/A	N/A	September 1997
EWR	Newark, NJ	EDITA	N/A	N/A	September 1997
FAI	Fairbanks, AK	EDITA	N/A	N/A	September 1997
FAT	Fresno, CA	EDITA	N / A	N/A	September 1997
FCA	Kalispell, MT	TSTM	N/A	N/A	September 1997

EHB- 11

Issuance 97- 10

9/17/97

D2

FNT	Flint, MI	EDITB	N/A	N/A	September 1997
FWA	Fort Wayne, IN	EDITB	N/A	N/A	September 1997
GEG	Spokane, WA	EDITA	N/A	N/A	September 1997
GSO	Greensboro, NC	EDITA	N/A	N/A	September 1997
HNL	Honolulu, HI	EDITB	N/A	N/A	September 1997
HOM	Homer, AK	TSTM	N/A	N/A	September 1997
HON	Huron, SD	TSTM	N/A	N/A	Completed
HSV	Huntsville, AL	EDITB	N/A	N/A	September 1997
HTL	Houghton Lake, MI	TSTM	N/A	N/A	September 1997
HVR	Havre, MT	TSTM	N/A	N/A	September 1997
IND	Indianapolis, IN	NGRVR	N/A	N/A	August 15, 1997
INL	International Falls, MN	TSTM	N/A	N/A	September 1997
ISN	Williston, ND	TSTM	N/A	N/A	September 1997
JAX	Jacksonville, FL	NGRVR	REQUIRED	REQUIRED	August 15, 1997
LAN	Lansing, MI	EDITA	N/A	N/A	September 1997
LAS	Las Vegas, NV	EDITA	N/A	N/A	September 1997
LAX	Los Angeles, CA	NGRVR	N/A	N/A	*July 15, 1997
LBB	Lubbock, TX	EDITB	N/A	N/A	September 1997
LND	Lander, WY	TSTM	N/A	N/A	September 1997
LNK	Lincoln, NE	EDITB	N/A	N/A	September 1997
MCI	Kansas City, MO	NGRVR	REQUIRED	N/A	August 1, 1997

MEM	Memphis, TN	NGRVR	N/A	N/A	Completed
MGM	Montgomery, AL	EDITB	N/A	N/A	September 1997
MKE	Gen. Mitchell Milwaukee, WI	NGRVR	REQUIRED	N/A	August 15, 1997
MKG	Muskegon, MI	EDITB	N/A	N/A	September 1997
MLI	Moline, IL	EDITB	N/A	N/A	September 1997
MSN	Madison, WI	EDITB	N/A	N/A	September 1997
MSP	Minneapolis-St. Paul, MN	NGRVR	N/A	N/A	August 15, 1997
OFK	Norfolk, NE	T S T M	N/A	N/A	Completed
OKC	Oklahoma City, OK	ACE	N/A	N/A	Completed
ORD	Chicago O'Hare, IL	NGRVR	N/A	N/A	August 15, 1997
ORF	Norfolk, VA	EDITB	N/A	N/A	September 1997
PBI	West Palm Beach, FL	EDITB	N/A	N/A	September 1997
PDX	Portland, OR	NGRVR	N/A	REQUIRED	*July 15, 1997
PHX	Phoenix, AZ	EDITA	N/A	N/A	September 1997
PIA	Peoria, IL	EDITB	N/A	N/A	September 1997
PVD	Providence, RI	EDITA	N/A	N/A	September 1997
PWA	Wiley Post, OK	ACE	N/A	N/A	Completed
RDU	Raleigh, NC	EDITA	N/A	N/A	September 1997
RFD	Rockford, IL	EDITA	N/A	N/A	September 1997
RIC	Richmond, VA	EDITA	N/A	N/A	September 1997
ROC	Rochester, NY	EDITA	N/A	N/A	September 1997

EHB-11

Issuance 97- 10
9/17/97

D4

SAN	San Diego, CA	EDITA	N/A	N/A	September 1997
SAT	San Antonio, TX	EDITA	N/A	N/A	September 1997
SAV	Savannah, GA	EDITB	N/A	N/A	September 1997
SBN	South Bend, IN	EDITB	N/A	N/A	September 1997
SDF	Standiford, Louisville, Ky	NGRVR	N/A	REQUIRED	August 15, 1997
SEA	Seattle-Tacoma, WA	NGRVR	N/A	REQUIRED	* July 15, 1997
SFO	San Francisco, CA	NGRVR	N/A	N/A	* July 15, 1997
SHR	Sheridan, WY	TSTM	N/A	N/A	September 1997
SPS	Wichita Falls, TX	TSTM	N/A	N/A	Completed
SSM	Salt Ste. Marie, MI	TSTM	N/A	N/A	September 1997
STC	St. Cloud, MN	TSTM	N/A	N/A	September 1997
STL	Lambert-St. Louis, MO	NGRVR	N/A	N/A	August 15, 1997
SYR	Syracuse, NY	EDITA	N/A	N/A	September 1997
TLH	Tallahassee, FL	EDITA	N/A	N/A	September 1997
TUL	Tulsa, OK	EDITA	N/A	N/A	September 1997
TUP	Tupelo, MS	TSTM	N/A	N/A	Completed
TUS	Tucson, AZ	EDITB	N/A	N/A	September 1997
TYS	Knoxville, TN	EDITB	N/A	N/A	September 1997
VCT	Victoria, TX	TSTM	N/A	N/A	Completed
VTN	Valentine, NE	TSTM	N/A	N/A	September 1997
WMC	Winnemucca, NV	TSTM	N/A	N/A	September 1997

YNG	Youngstown, OH	EDITB	N/A	N/A	September 1997
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TSTM - Thunder Storm Sensor

NGRVR - Next Generation Runway Visibility Range

EDIT(A/B) - RVR edit

* Firmware was shipped directly to the following sites: SFO, LAX, PDX and SEA. Technicians do not need to order firmware for these sites.

EHB- 11

Issuance 97- 10

9/17/97

D6

ASOS MODIFICATION NOTE 40 (for Electronics Technicians)

Engineering Division
W/OSO321:BGM

SUBJECT	Interface Connection and VDU Configuration for the Digital Automatic Terminal Information Service (DATIS) and the Systems Atlanta Information Display System (SAIDS).
PURPOSE	Addition of the DATIS and SAIDS ports for FAA use.
EQUIPMENT AFFECTED	ASOS (ACOMM)
PARTS REQUIRED	None
MOD PROCUREMENT	Internal modems and I/O panel filters will be issued by WSH as required for BUF, SDF, MEM & ATL. Contact Bob McCormick (301) 713-1835 if there are any discrepancies in either table B or C.
SPECIAL TOOLS REQUIRED	None
TIME REQUIRED	1 hour
EFFECT ON OTHER INSTRUCTIONS	None.
AUTHORIZATION	Approvals of request for changes FAA021 (DATIS), FAA026 (SAIDS)

GENERAL:

This modification note provides instructions to interface the DATIS and SAIDS ports at 62 airports. Six ASOS sites have not been installed: Chicago, Midway (MDW); Ft. Lauderdale (FLL); Orange County (SNA); Oakland (OAK); San Jose (SJC); and Ontario (ONT). Unused ports on the SIO boards are to be used for the DATIS (Table B) and SAIDS (Table C) interface at 30 sites. Both the DATIS and SAIDS are FAA equipment. ASOS provides the 1 minute, hourly and special observations to this equipment via a Video Display Unit (VDU) port. Technicians will provide the FAA access to an existing VDU or the ACU I/O panel. The FAA will connect an RJ11 or a DB-25 connector/cable to one of the ACU ports or connect an RS-232 "Y" cable at the back of an existing VDU, which will interface to the DATIS or SAIDS equipment. The technician will not reassign any existing devices that are currently in use and approved under the site configuration. Direct cable runs for this modification shall not exceed 100 feet in length. The cable distance is calculated from the ACU to the DATIS or SAIDS equipment. When the length exceeds 100 feet the FAA will provide the external modem, cables, and a dedicated or leased telephone line.

PROCEDURE


1. Call the AOMC at 1-800-242-8194. Inform the person who answers the phone at which ASOS site you will be installing Modification Note 40.
2. Get the approval of the responsible MIC/OIC before starting. Notify any point of contacts required to gain access.
3. Make the appropriate SYSLOG entries (MAINT-ACT-FMK) **Mod 40**
 - a. Log on as **TECH**.
 - b. Key the **MAINT** screen.
 - c. Key the **ACT** page.
 - d. Key **START** - Stop here and perform **Mod 40**.
Upon completion of the **Mod 40**, log onto the system.
4. The 22 sites listed in Table A require a direct hook up to a one existing VDU. An FAA representative or technician will provide a type of "Y" connector or a cable that will parallel the RS-232 cable already connected to the "MASTER" input connector on the back of the VDU. Remove the cable connected to the back of the VDU and connect the "Y" cable or connector in its place. Reconnect the ASOS RS-232 cable to one of the ports on the "Y" connector/cable. Verify that the VDU information is being updated. Have the FAA connect the DATIS RS-232 cable to the other port of the "Y" connector/cable. Again, verify that the information on the VDU is being updated. If at any point the VDU information is not updating, remove the cable or connector and have the FAA replace the part.
5. The 23 DATIS sites listed in Table B, and 7 SAIDS sites listed in Table C, have available hardware already installed in the ACU necessary to complete the interface connection. In some cases, a VDU port may be installed and enabled but not used. In those cases, the technician can plug the DATIS or SAIDS cable into the appropriate connector on the ACU I/O panel. Tables B and C identifies the recommended port connection. Continue with step 8.
6. Based on the configuration data, only four systems require extra hardware: BUF, SDF, MEM, and ATL. If the configuration listed in Table B does not match the current system configuration and additional hardware is required, contact Bob McCormick at (301) 713-1834 X 167.
7. Install the modem and adapter in the following locations: for BUF, SDF, and ATL use modem slot No. 9; For MEM use modem slot No. 8. Install filters in the following locations: for BUF, SDF, and ATL use I/O panel location J20; for MEM use I/O panel location J19. Connect the spare SIO port to the appropriate modem. The 25 pin RS-232 connectors on the ends of the extra white wire bundles found inside the ACU are labeled as to which SIO board and port to which they are connected. Connect the phone side of the modem to the newly installed filter using an RJ11 cable.
8. If an OID is not available, the technician will use the laptop computer to configure the DATIS.
9. Go to the REVIEW, SITE, CONFIG, COMMS configuration page and configure the SIO port as a VDU, which must agree with the hardware configuration performed in step 2 or 5. Set the

9. Go to the **REVIEW, SITE, CONFIG, COMMS** configuration page and configure the SIO port as a VDU, which must agree with the hardware configuration performed in step 2 or 5. Set the following parameters: 2400, N, 8, 1, NONE, LEASED, modem number, and TONE for remote connections and 2400, N, 8, 1, NONE, and Hardwire for local connections.

10. Using a spare VDU, connect to the newly installed port and verify that the VDU displays the 1 minute screen. Mark the 1A9 panel to indicate which connector is DATIS or SAIDS. This completes the installation.

Reporting Modification

Target date for completion of this modification is identified in the last column of Tables A, B, and C. Report completed modification on WS Form A-26 maintenance record, following instructions in EHB-4, part 2, Appendix F, using reporting code ACOMM. If the hardware configuration described in Tables B and C is not correct, please provide the updated information on the A-26. Refer to attachment A for example of form A-26.



John McNulty
Chief, Engineering Division

Attachment A

T A B L E A

Site Location	Site ID	ASOS ACU Location	Interface	DATIS Installation Date
Albuquerque, NM	ABQ	FAA/NWS Bldg Stor. Rm (1st flr)	ASOS VDU	10/20/96
Austin, TX	AUS	relocated to ATCT	ASOS VDU	11/18/96
Cleveland, OH	CLE	Federal Facilities Bldg Eq Rm (2nd flr)	ASOS VDU	12/2/96
Denver, CO	DEN	NWS Bldg. Ops Area (1st flr)	ASOS VDU	10/15/96
Dallas/Ft. Worth, TX	DFW	Delta Hangar NWS CMO (2nd flr)	ASOS VDU	11/4/96
El Paso, TX	ELP	relocated to ATCT	ASOS VDU	10/16/96
Newark, NJ	EWR	Bldg #51 NWS Ops (2nd flr)	ASOS VDU	10/16/96
Greensboro, NC	GSO	NWS Office	ASOS VDU	10/9/96
Washington, DC (Dulles)	IAD	Telephone Bldg Wx Obs. Area (3rd flr)	ASOS VDU	12/2/96
Houston Intercontinental, TX	IAH	Qualitron Bldg Contract Obs. Office (3rd flr)	ASOS VDU	10/23/96
Indianapolis, IN	IND	new WFO Eq Rm (1st flr)	ASOS VDU	10/9/96
New York, NY (Kennedy)	JFK	Intl. Arrival Bldg. Wx Obs. Office (2nd flr)	ASOS VDU	11/18/96
New York, NY (La Guardia)	LGA	Marine Air Terminal Bldg. CWO's Office (3rd flr)	ASOS VDU	10/28/96
Miami, FL	MIA	Gen. Avia. Cntr. Bldg NWS Office (1st flr)	ASOS VDU	10/28/96
New Orleans, LA	MSY	NWS CMO Electrical Closet (2nd flr)	ASOS VDU	10/15/96
Portland, OR	PDX	relocated to ATCT	ASOS VDU	10/30/96
Philadelphia, PA	PHL	Main Terminal CWO's Office (4th flr)	ASOS VDU	10/15/96
San Antonio, TX	SAT	ATCT Comm Eq Rm (1st flr)	ASOS VDU	10/28/96
Seattle, WA	SEA	Terminal Complex Bldg Wx Eq Rm (5th flr)	ASOS VDU	12/9/96
San Juan, PR	SJU	Terminal Bldg Wx Eq Rm (5th flr)	ASOS VDU	12/9/96
Salt Lake City, UT	SLC	Kibbie Exec. Terminal NWS Ops Area (1st flr)	ASOS VDU	10/15/96
Tampa, FL	TPA	Hangar One Wx Eq Rm (2nd flr)	ASOS VDU	10/30/96

TABLE B

Site Location	Site ID	ASOS ACU Location	Recommended Modem & I/O Panel Port Connection with current use.	D-ATIS Installation Date
Windsor Locks, CT	BDL	relocated to ATCT	1) VDU modem #7 - J18 2) CVD modem #6 - J17 3) Modem #8 - J19	11/18/96
Nashville, TN	BNA	ATCT Comm Eq Rm	1)AWJPS modem #R-J19	10/23/96
Boston, MA	BOS	ATCT Comm Rm (21st flr)	1)AWIPS modem #8 - J19	10/16/96
Burbank, CA	BUR	ATCT Eq Rm (1st flr)	1) CVD modem #6 - J17 2)Printer modem #1 - J12	12/2/96
Baltimore-Washington, MD	BWI	relocated to ATCT	1) CVD modem #6 - J17 2)AWIPS modem #R-J19	10/30/96
Charlotte, NC	CLT	ATCT Radio Eq Rm (1st flr)	1) CVD modem #7 - J18 2)VDU modem #10-J21	10/15/96
Columbus, OH	CMH	relocated to ATCT	1) CVD modem #6 - J17	11/4/96
Cincinnati, OH	CVG	Terminal Bldg B NWS Ops Area (2nd flr)	1) CVD modem #6 - J17 2)AWIPS modem #8 - J19	10/17/96
Washington, DC (National) [Old ATCT]	DCA	Terminal Bldg Comm Equip Rm (3rd flr)	1) OID (CVD) modem #6 - J17 2)AWIPS modem #8 - J19 3) AFOS modem #10 - J21	10/23/96
Detroit, MI (Metro)	DTW	ATCT AF Work Rm (1st flr)	1) J17 2) J19	10/15/96
Las Vegas, NV	LAS	ATCT FAA Radio Eq Rm (1st flr)	1)VDU modem #7-J18 2) Printer modem #6 - J17 3) CVD modem #8 - J19	10/23/96
Los Angeles, CA	LAX	ATCT Eq Rm (4th flr)	1) Modem #8 - J19 2) RTA modem #9 - J20 3)ABT modem #10-J21	11/15/96
Orlando, FL	MCO	ATCT FAA Eq Rm (1st flr)	1) CVD modem #6 - J17 2) Modem #8 - J19 3) Modem #9 - J20	10/16/96

Site Location	Site ID	ASOS ACU Location	Recommended Modem & I/O Panel Port Connection with current use.	D-ATIS Installation Date
Milwaukee, WI	MKE	ATCT Telco Rm (1st flr)	1) VDU modem #7-J18 2) CVD modem #6 - J17 3) Modem #8 - J19	10/16/96
Minneapolis-St. Paul, MN	MSP	ATCT Telco Eq Rm (4th flr)	1) CVD modem #6 - J17 2) Modem #10-J21	12/2/96
Chicago,IL (O'Hare) [New ATCT]	ORD	ATCT Field Cable Rm B (basement)	1) CVD modem #6 - J17	11/18/96
Phoenix,AZ	PHX	ATCT Eq Rm (1st flr)	1) J18 2) J19	10/23/96
Pittsburgh, PA	PIT	ATCT Radar Rm (2nd flr)	1) AWTPS modem #8 - J19 2) AFOS modem #9 - J20 3) AFOS spare modem #10-J21	11/12/96
Raleigh-Durham, NC	RDU	AFSS Telco Rm (1st flr)	1) AWIPS modem #8 - J19 2) AFOS modem #10 - J21	10/15/96
San Diego, CA [New ATCT]	SAN	ATCT Eq Rm (3rd flr)	1) VDU modem #7 - J18 2) CVD modem #6 - J17 3) Modem #8 - J19 4) Modem #9 - J20	10/20/96
San Francisco, CA	SFO	Intl Term/ATCT NWS Office (6th flr)	1) VDU modem #7 - J18 2) CVD modem #6 - J17 3) AWLPS modem #8 - J19	10/15/96
Sacramento, CA	SMF	ATCT Eq Rm (1st flr)	1) VDU modem #7 - J18 2) CVD modem #6 - J17	11/12/96
Tulsa, OK	TUL	relocated to ATCT	1) VDU modem #7 - J18 2) CVD modem #6 - J17 3) Modem #8 - 119	12/9/96

TABLE C

Site Location	SID	Recommended I/O Port Connection	SAIDS Installation Date
Des Moines, IA	DSM	Local SAIDS Port 1) ADAS-J29	
Wichita, KS	ICT	Remote SAIDS Port 1) VDU modem #7-J18 2) CVD modem #6-J17	11/15/96
Kansas City, MO [New ATCT]	MCI	Local SAIDS Port 1)J28 2)J29	10/23/96
Loathe, KS	OJC	Local SAIDS Port 1) ADAS J29 2) AWIPS J30	11/15/96
Omaha, NE	OMA	Local SAIDS Port 1) ADAS-J29	11/15/96
Springfield, MO	SGF	Remote SAIDS Port 1)VDU modem #7 - J18 2)CVD modem #6 - J17	11/15/96
St. Louis, MO	STL	Remote SAIDS Port 1)VDU modem #7 - J18 2)CVD modem #6 - J17 3)AWIPS modem #8 - J19	11/15/96

WS HQ USE ONLY		WS FORM A-26 (4/94) <small>Supersedes WS Form A-23 and WS Form H-26, which are obsolete</small>				<small>U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE</small>				Document Number G 49978					
ENGINEERING MANAGEMENT REPORTING SYSTEM MAINTENANCE RECORD															
General Information		1. Open Date 09 / 27 / 96		Time 0900		2. Initials MRB		3. Response Priority (check one) <input type="radio"/> Immediate <input type="radio"/> Low <input type="radio"/> Routine <input checked="" type="radio"/> Not Applicable			4. Close Date 09 / 27 / 96		Time 1000		
5. Description <div style="text-align: center; padding: 10px;">MODIFY ACOMM I.A.W. MOD NOTE 40</div>															
Equipment Information		6. Station ID PHL		7. Equipment Code ACOMM		8. Serial Number 001			9. TM M		10. AT M		11. How Mal. 999		
12. EQUIPMENT OPERATIONAL STATUS TIMES		a. Fully Operational <div style="border: 1px solid black; height: 20px; width: 80px; margin: 0 auto;"></div>		b. Logistics Delay <div style="border: 1px solid black; height: 20px; width: 80px; margin: 0 auto;"></div>		Partly Operational		c. All Other <div style="border: 1px solid black; height: 20px; width: 80px; margin: 0 auto;"></div>		d. Logistics Delay <div style="border: 1px solid black; height: 20px; width: 80px; margin: 0 auto;"></div>		Not Operational		e. All Other <div style="border: 1px solid black; padding: 2px 10px; text-align: center;">1:00</div>	
13. Parts Failure Information										14. Work Load Information					
Block #	a. ASN	b. NSN	c. TM	d. AT	e. How Mal.	f. Qty.	g. Maint. Hrs.	Type	Staff Hrs.						
1								a. Routine							
2								b. Non-routine							
3								c. Travel							
4								d. Misc.	001:00						
5								e. Overtime							
Miscellaneous Information		INSTALL INTERFACE CONNECTION AND VDU CONFIGURATION FOR THE DATIS AND THE SAIDS								16. Initials MRB					
17. SPECIAL PURPOSE REPORTING		a. Mod. No. 40		b. Mod./Act./Deact. Date 09/27/96		c.		d.		e.					
18. CONFIGURATION MGMT. REPORTING <small>(use as directed)</small>		a. Block #		b. Manufacturer's Part No. of New Part						c. Revision No. of New Part					

ASOS MODIFICATION NOTE 41 (for Electronics Technicians)

Engineering Division

W/OSO321:BGM

SUBJECT : Line filter for wind direction assembly.

PURPOSE : Signal noise suppression for the wind direction sensor.

EQUIPMENT AFFECTED : ASOS

PARTS REQUIRED : Belfort, P/N 33212, Filter, S100-FMK-60, qty. 1

MOD PROCUREMENT : Technicians will order from NLSC one line filter each ASOS wind direction system.

SPECIALTOOLS
REQUIRED : None

TIME REQUIRED : 1 hour

EFFECT ON OTHER
INSTRUCTIONS : None

AUTHORIZATION : This modification is authorized by Engineering Change Proposal E94SM05F190. This modification was successfully tested at Sterling, Virginia, and Silver Spring, Maryland.

GENERAL

A wind direction sensor filter has been added to prevent cross talk on the signal lines. The filter is easily connected in line with the wind direction transmitter signal lines.

PROCEDUREBefore and After Installation Procedures

Read and follow the procedures related to installation of the wind direction sensor filter.

BEFORE INSTALLING FILTER

1. Call the AOMC at 1-800-242-81 94 and provide notification on which ASOS you will be installing the sensor filter.
2. Get approval of the responsible MIC/OIC before starting installation. You may install on any day of the month if restrictions in steps 3 and 4 are satisfied.
3. **Commissioned Sites Only:** Do not start installation during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of these conditions are expected within 3 hours. The responsible MIC/OIC will define these meteorological conditions.
4. Do not start the installation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Although about 15 minutes should be sufficient, allow one hour to complete installation and restart ASOS.
5. Immediately before beginning work at NWS staffed sites, the MIC/OIC/Observer will inform the tower and any other critical users that ASOS, wind system will be shut off for wind direction filter installation. At an unstaffed site, the el tech will inform the tower using Controller Video Displays (CVD) and Operator Interface Devices (OID).
6. Do not begin the installation process, until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.
7. Turn off report processing for the wind
8. Make the appropriate SYSLOG entries (MAINT-ACT-FMK) Mod 41
 - a. Log on **as TECH.**
 - b. Key the **MAINT** screen.
 - c. Key the **ACT** page.
 - d. Key **START** Stop here and perform Mod 41.
Upon completion of the Mod 4, log onto the system.

WIND DIRECTION FILTER INSTALLATION

9. Inside the DCP equipment cabinet, ensure that the circuit breaker on wind sensor power control module is set to **OFF** (right) position.
10. Using a large flat-tipped screwdriver, open wind sensor electronics enclosure (A1) access door.
11. Locate and disconnect P1 from J1 inside the wind sensor electronics box (A1).
12. Connect the printed wiring line filter board provided with S100-FMK-60 (Belfort P/N 33212) between P1 and J1 (reference attachment A).

13. Close and secure the electronic (A1) access door. At the DCP set the wind sensor by power control module to the ON (left) position.

AFTER INSTALLING FILTER

14. When ASOS is restarted at unstaffed sites, call to inform towers that the work is complete. (At staffed sites, the MIC/OIC/Observer will call the tower).
15. If on-site NWS staff provides backup while the installation is underway, no special observation is needed when wind system is restarted.
16. Inform the office staff the wind system is again operational. If less than 10 minutes remain until the next hourly observation, augmentation of the wind may be required. The chart below indicates how long it takes the wind sensor to report after a start up.

Times Needed for Elements to be Reported Automatically

	<u>Minimum</u>	<u>Maximum</u>
Wind direction	1 minute	2 minutes
Wind speed	1 minute	2 minutes

17. Verify that wind data appears on the one minute page. Call the AOMC at 1-800-242-8194 and tell the operator:
 - a. Your location.
 - b. That installation of the wind filter has been completed.
 - c. That the wind system is operational.
18. Enter in the SYSLOG that maintenance has been completed.
 - a. Key the **MAINT** screen.
 - b. Key the **ACT** page.
 - c. Key **FMK** - Enter the Field Mod Kit (FMK) number as follows: **Mod 41**.
On the second line of the screen verify that only **Mod 41** is displayed. Complete by entering Y in the Y/N if only **Mod 41** is displayed.
 - d. Check the **SYSLOG** and verify the **FMK** message. Enter a comment in the SYSLOG stating that wind direction filter has been installed.

Reporting Modifications

This modification should be completed on next visit to the site. Report completed modification on a Weather Service Form A-26 maintenance record, per instructions in EHB-4, Part 2, Appendix F, using reporting code AWIND. (See Attachment 6 for a completed sample of WS Form A-26).



John McNulty
Chief, Engineering Division

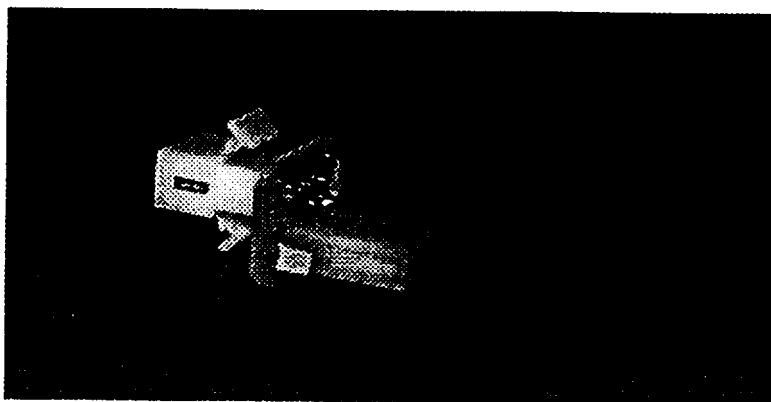
Attachment A

Attachment B

EHB- 11

Issuance 96-22

12/12/96



WS HQ USE ONLY		WS FORM A-26 (4/94) <small>Supersedes WS Form A-23 and WS Form H-28, which are obsolete</small>				U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE				Document Number G49978		
		ENGINEERING MANAGEMENT REPORTING SYSTEM MAINTENANCE RECORD										
General Information		1. Open Date 05/ 01 / 96		Time 0900		2. Initials MRB		3. Response Priority (check one) <input type="radio"/> Immediate <input type="radio"/> Low <input type="radio"/> Routine <input checked="" type="radio"/> Not Applicable		4. Close Date Time 05 / 01 / 96 1100		
5. Description MODIFY ASOS WIND DIRECTION SYSTEM I.A.W. MOD NOTE 41												
Equipment Information		6. Station ID JKL		7. Equipment Code AWIND		8. Serial Number A0240		9. TM M		10. AT M		
11. How Mal. 999												
12. EQUIPMENT OPERATIONAL STATUS TIMES		a. Fully Operational <div></div>		b. Logistics Delay <div></div>		Partly Operational		c. All Other <div></div>		d. Logistics Delay <div></div>		
										e. All Other 02:00		
13. Parts Failure Information										14. Work Load Information		
Block #	a. ASN	b. NSN	c. TM	d. AT	e. How Mal.	f. Qty.	g. Maint. Hrs.	Type	Staff Hrs.			
1								a. Routine				
2								b. Non-routine				
3								c. Travel				
4								d. Misc.	002:00			
5								e. Overtime				
Miscellaneous Information		15. Maintenance Comments INSTALLED LINE FILTER FOR ASOS WIND DIRECTION SYSTEM									16. Initials MRB	
17. SPECIAL PURPOSE REPORTING		a. Mod. No. 41		b. Mod./Act./Deact.Date 05/01/96		c.		d.		e.		
18. CONFIGURATION MGMT. REPORTING (use as directed)		a. Block #		b. Manufacturer's Part No. of New Part						c. Revision No. of New Part		

ASOS MODIFICATION NOTE 45 (for Electronics Technicians)

Engineering Division

W/OSO321:BGM

SUBJECT : Connection of the Automated Surface Observing System (ASOS) to the Federal Aviation Administration (FAA) communication network using codex modems

PURPOSE : To enable communication between ASOS and the National Weather Service telecommunications gateway via the FAA communication network

EQUIPMENT AFFECTED : ASOS, ACU (ACOMM)

PARTS REQUIRED : Bridging clips, 66-series (4ea)
RJ-11 surface mounted block
RJ-11 connectors (as required)
RJ-45 connectors (as required)
RJ-11 4 conductor stranded telco cable (as required)
24 AWG 4-wire telco cable wire to connect a surface mounted block to demarc panel.

MOD PROCUREMENT : Technicians will obtain materials locally. The National Weather Service Headquarters (WSH) will issue ISO boards for sites listed in Appendices A and B.

SPECIAL TOOLS REQUIRED : RJ-11/RJ-45 connector crimping tool (1ea)
Punch down tool (1ea)

TIME REQUIRED : 2.5 hours

EFFECT ON OTHER INSTRUCTIONS : None

AUTHORIZATION : Not Applicable

GENERAL

Technicians must coordinate with the FAA point of contact before scheduling the installation of this modification at any site. The FAA point of contact is Jerry Kranz at 202-267-8675 or E-mail address Jerry.Kranz@FAA.dot.gov. Any technical questions should be directed to Woody Weir (ASOS Maintenance Assurance Department) at 301-713-1835, Ext. 129. Motorola Codex 3600 modems are being used with many ASOS, to enable communication between the ASOS and the (NWS) telecommunications gateway, via the FAA communication network. The codex modem can be installed, either internal or external of the ASOS Acquisition Control Unit (ACU) cabinet

near the FAA communication network equipment. Each configuration, internal or external to the ACU requires different connection procedures. This modification handles each configuration separately.

CAUTION

ADAS (AWOS / ASOS Data Acquisition System) synchronization requires the ASOS SIO port for the Codex to be set to external synchronization when the port is configured. Since SIO port synchronization is controlled in pairs, both ports 1 and 2 or ports 3 and 4 shall be set to external synchronization. If port 1 is used for the Codex modem, port 2 should be left unused (vise-versa if port 2 is used for the modem) and ports 3 and 4 may be used for any other ASOS connection. Likewise, if port 3 is used for the Codex modem, port 4 should remain unused (vise-versa if port 4 is used for the modem) and ports 1 and 2 will be available for other ASOS use. The connection of ASOS peripherals to the other half of an SIO port pair configured for a Codex will result in intermittent communications with the ASOS peripheral. All ASOS connections are via RS-232 and any ASOS configuration utilizing RS-422 on SIO Board #1 must be changed to an unused RS-232 board.

BEFORE CONNECTING THE MOTOROLA CODEX MODEM

1. The installer shall coordinate with the FAA point of contact, Jerry Kranz at 202 -267-8675, prior to scheduling work on this modification.
2. Once on site, call the AOMC at 1-800-242-8194 and tell them which ASOS Motorola Codex modem will be connected.
3. Get approval of the responsible MIC/OIC before starting installation. Connect the Motorola codex modem on any day of the month. Steps 3 thorough 8 apply only to those sites listed in Appendix A requiring the installation of an SIO card identified with a check mark (J). Continue to step 9 if an SIO card is not required.
4. Commissioned sites only: Do not start installation during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of these conditions are expected within three hours. The responsible MIC/OIC will define these meteorological conditions.
5. Do not start the installation at a time that will conflict with scheduled synoptic observations at, 00, 03, 06, 09, 12, 15, 18, and 212. Although about 15 minutes should be sufficient, allow 1 hour to complete installation and restart ASOS.
6. Immediately before working at NWS staffed sites, the MIC/OIC/Observer will inform the tower and any other critical users that ASOS will be shut off for Motorola Codex modem connection.

EHB-11

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6/20/97

At an unstaffed site, the technician will inform the tower using Controller Video Displays (CVD) and Operator Interface Devices (OID).

7. Do not begin the installation process until immediately after they have transmitted an hourly observation. At NWS-staffed sites, they will carry out normal backup observing procedures.
8. Disable all hardwire and dial communication ports to ASOS, (REVUE-SITE-CONFIG-COMMS). Go into the AOMC page (REVUE-SITE-VERSN-AOMC); wait for the external communication and the site physical lines to change from AUTO UPLOAD REQ to COMPLETE before going to the next step. The system voice function will automatically broadcast a not available message when the ACU power is turned off.
9. Make the appropriate SYSLOG entries (MAINT-ACT-FMK) Mod 45
 - a. Key the **MAINT** screen;
 - b. Key the **ACT** page;
 - c. Key **START** - Stop here and perform Mod 45; and
 - d. Upon completion of the Mod 45, log onto the system.

AFTER COMPLETING MODIFICATION

10. Step 10 through 12 are only required if an SIO card has been installed. When ASOS is restarted at nonstaffed sites, call to inform towers that the work is complete. (At staffed sites, the MIC/OIC observer will call the tower).
11. If on-site NWS staff provides backup while the installation is underway, special observation is not needed when the wind system is restarted.
12. Inform the office staff that ASOS is again operational. If less than 25 minutes remain until the next hourly observation, augmentation of the ceiling may be required. Augmenting several elements may be necessary or even the entire observation. The chart below shows the times needed for ASOS to report each observation element automatically after a start up.

Times Needed for Elements to be Reported Automatically

	<u>Minimum</u>	<u>Maximum</u>
Pressure.	60 seconds	10 minutes
Precipitation Amount.. . . .	60 seconds	*
Wind direction.	2 minutes	7 minutes
Wind speed	2 minutes	7 minutes
Precipitation Type	2 minutes	*
Temperature	5 minutes	10 minutes
Dew Point.	5 minutes	10 minutes
Visibility.	10 minutes	15 minutes
Obstruction to Visibility	10 minutes	*
Ceiling.	30 minutes	35 minutes

* Maximum time not applicable since phenomena may not be present. Minimum time applies if phenomena are present.

13. Verify that the ASOS transmitted an hourly observation. Call the AOMC at 1-800-242-8194 and tell the operator:

- a. Your location;
- b. That connection of the codex modem has been completed; and
- c. That the ASOS is operational.

14. Enter the SYSLOG information to indicate that maintenance has been completed.

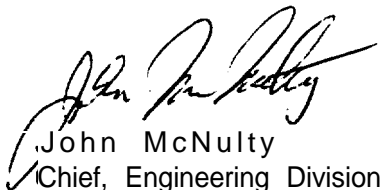
- a. Key the MAINT screen,
- b. Key the ACT page,
- c. Key FMK - Enter the Field Mod Kit (FMK) number as follows: Mod 45;
On the second line of the screen verify that only Mod 45 is displayed. Complete by entering Y in the Y/N line if only Mod 45 is displayed.
- d. Check the SYSLOG and verify the FMK message. Enter a comment in the SYSLOG stating that THE CODEX MODEM has been connected.

15. Complete this step if an SIO card was installed. At an expansion site with ATCT, the technician will contact the ATCT and supply information on the following:

- a. ASOS maintenance is completed;
- b. ASOS have been restored to service;
- c. Tower CVDs and OIDs need to be turned on, and TRACON displays need to be turned on; and
- d. This completes modification note 45.

Reporting Modification

A completion target date of this modification is 5 days after long line connection. Report completed modification on a Weather Service Form A-26 maintenance record, per instructions in EHB-4, Part 2, Appendix F, using reporting code ACOMM. See Appendix C for a completed sample of WS Form A-26.



John McNulty
Chief, Engineering Division

Appendix A
Appendix B
Appendix C

INSTALLATION OVERVIEW FOR CONNECTING AN INTERNAL CODEX MODEM:

This procedure identifies pre-installation activity steps necessary to verify proper installation of cabling from the modem to the demarc, procedures for installing the surface mounted RJ-11 block (if not already provided by the FAA), and the modem settings required for operation.

The codex modem installed inside the ACU cabinet will use a leased line between the ASOS codex modem and a similar codex modem located at an FAA Air Route Traffic Control Center (ARTCC). The 4 wire leased line will be provided by the FAA. Information on the circuit number should be provided by the FAA point of contact.

Activation of the codex modem interface requires coordination between the ASOS technician, at the ASOS site and the FAA technician at the ARTCC. The FAA technician activates the FAA center communication equipment. The ASOS technician checks several basic modem parameters and completes the connection between I/O panel assembly 1A9, J-8 on the back panel of the ACU and the FAA telco demarc located on a wall nearby.

The FAA demarc typically consists of a 66-series analog communication block (punch down block). The NWS technician will perform the proper routing of the cable from the ACU to the 66-series block if required. This includes installation of a surface mount RJ-11 jack near the 66-series block (if not already installed) and attaching the 4-wire, telco cable between I/O panel assembly 1A9, J-8 on the ACU and the surface mount RJ-11 jack.

PROCEDURE:

1.O INTERNAL CODEX MODEM CONNECTION/ACTIVATION AT THE ASOS SITE:

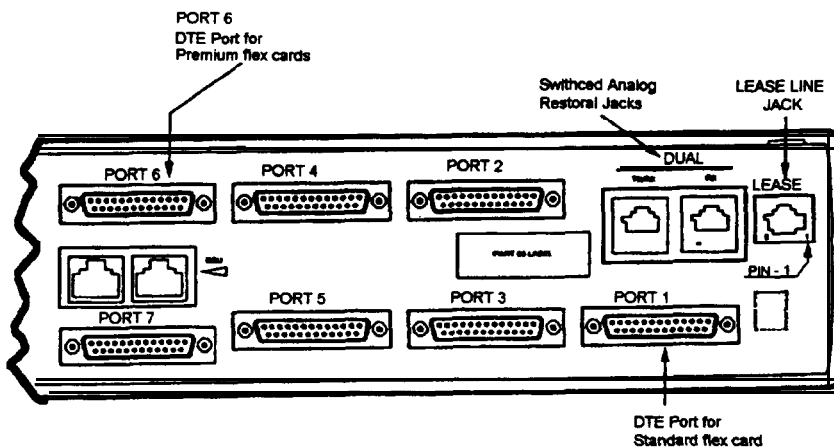
Before traveling to an ASOS Site:

- a. Sites listed in **Appendix A** contain **internal codex modems**. Verify that a codex modem has been installed in the ASOS ACU. If a modem has not been installed, inform the FAA point of contact.
- b. Contact Jerry Kranz who will assist with testing the ASOS to FAA network communication link. Establish a date and time when the FAA point of contact will be available to provide detailed telephone support during installation. The FAA point of contact will provide the modem address to be programmed into the codex modem (if necessary).
- c. Sites listed in Appendix A that require installation of an SIO card are indicated by a check mark (J). Remotely access the ASOS and verify that an SIO port is available to be assigned to the codex modem (ADAS). Two consecutive ports on a single SIO card must be available. Ports 1 and 2, or Ports 3 and 4, are the only allowable configurations. If the ports are not available, an additional SIO board (XVME-49011) is required. Contact Bobby McCormick to obtain an SIO board.

2.0 INSTALLATION STEPS FOR INTERNAL CONNECTION AND ACTIVATION:

Once at a site, complete the following:

- a. Verify that the codex modem has been installed in the ACU cabinet and that power is connected.
- b. Verify that the connector from the correct SIO board and port is connected to the back of the codex modem. For a codex modem with a Standard flex cartridge (P/N M10454) the DB-25 connector should be on modem Port 1. For a codex modem with a Premium flex cartridge (P/N M10493) the DB-25 connector should be on modem Port 6.



- c. Verify that a telco cable has been connected between the LEASE RJ-45 jack (reference diagram below) on the rear of the codex modem and ACU I/O panel assembly 1A9J-8 (an RJ-11 jack) via the EMI filter. Verify that this cable is wired as follows:

RJ-45 PIN	COLOR/FUNCTION	RJ-11 PIN
1	Red or Green / Transmit	2
2	Green or Red / Transmit	3
7	Yellow or Black / Receive	1
8	Black or Yellow / Receive	4

If a cable is found incorrectly wired at the site, it can be corrected by cutting off one of the connectors and rewiring the cable.

- d. Find the incoming 4-wire telco line termination point. This is usually a 66-series cross-connect block or an RJ-11 surface mount block on the wall near the ACU. The FAA point of contact should provide assistance in locating and verifying the correct circuit.
- e. If a RJ-11 surface mount block (jack) has been installed, connect the RJ-11 block to J-8 on the ACU I/O panel using a cable made to length at the ASOS site.
- f. Use steps 1 through 6 to install the RJ-11 block, (if one is not already installed), and connect it to the cross connect block and the ACU I/O panel.
 1. Mount a RJ-11 surface mounted block on the wall near the existing telco installation.
 2. Find the leased 4-wire circuit on the cross connect block. The circuit should connect to four punch down terminals at the top of the block. The 4-wire leased circuit may be connected to some FAA circuit loopback equipment (responder) and back to the block. The FAA point of contact should have already verified (if possible), that the lines between the FAA ARTCC and the ASOS site are active and operating at the proper levels.
 3. Determine the transmit and receive pairs by either finding a tag on the circuit or asking the FAA technician at the Center to send a tone on one of the pairs. By convention, the top two terminals should be the ASOS codex modems transmit pair and the bottom two the ASOS modem receive pair.
 4. Connect the RJ-11 block to the cross connect block to continue the I-wire circuit to the ASOS modem. Use 24-26 AWG solid data comm wire intended for insulation displacement termination. RJ-11 connector pins 2 and 3 (red and green) connect to the transmit pair and pins 1 and 4 (yellow and black) connect to the receive pair.
 5. Connect the RJ-11 block to J-8 on the ACU I/O panel using a 4-conductor cable made to length at the ASOS site.
 6. Using bridging clips as jumpers, connect the four wires installed in step d. Above to the FAA connection side of the 66 block by bridging the middle contacts together.
- g. The ASOS SIO port that communicates with the codex modem must be configured properly and enabled. Ensure that the SIO port configuration, obtained from the ASOS COMMS configuration page, reflects the following:

FUNCTION	ADAS	HANDSHAKE	SYNCHRONOUS
STATUS	ENABLED	CONNECTION	HARD-WIRE
BAUD RATE	2400		
PARITY SELECT	NONE		
BITS/CHAR	8		
STOP BITS	1		

- h. The ASOS ADDRESS field on the ASOS EXTERNAL COMMUNICATIONS page (REVUE-SITE-CONFIG-EXTRN) will need to contain the ASOS polling address as assigned by the FM data acquisition system (ADAS). This parameter can be entered by the ASOS technician if it is available, or it can be entered by the AOMC when it becomes available. By default the address is 100, which is an invalid ADAS address. Valid addresses are odd numbers from 03 to 21.
- i. The codex modem will need several parameters to be set before the FAA center will be able to remotely program the remaining strapping parameters. The information necessary to access the modem menus is presented in the codex modem chapter of the ASOS site technical manual (chapter 13). The parameters that need to be set are:
 - 1. The ADDRESS field under the NTK CTL * category to the designated modem address (obtain from FAA POC).
 - 2. The TX LVL: field under the ANALOG*> LS ANLG+ category to -13 dBm.
 - 3. If this is a multi point circuit (modem uses a 'Standard" Flex cartridge), the OP MODE: field under the ANALOG*> LS ANLG+ category must be set to MP-S. If this is a point to point circuit (modem uses a 'Premium" Flex cartridge), the OP mode field under the ANALOG *> LS ANGL + category must be out to TURBO P-P.
- j. The technician at the ARTCC should now be able to remotely download the complete modem strapping parameters.
- k. The FAA point of contact at the ARTCC should test and verify codex modem operation. The FAA point of contact will provide instructions and should direct efforts needed to verify the codex modem is operational.

This completes the internal codex modem connection/activation procedure.

INSTALLATION OVERVIEW FOR CONNECTING AN EXTERNAL CODEX MODEM:

When an ASOS is connected to an external codex modem, the long line communication path is usually over an existing FAA network (typically the FAA's Data Multiplexing Network, or DMN). The ASOS data is multiplexed onto an existing FAA communication circuit by the codex modem and is demultiplexed at a FAA, ARTCC by another codex modem.

The connection activities involved in connecting ASOS to an external codex modem are limited to configuring an ASOS serial I/O port for use as an Automated Data Acquisition System (ADAS) interface and connecting the serial I/O port to the J29 connector on the ACU I/O panel. The FAA should provide the cable connecting J29 to the external codex modem.

1.0 EXTERNAL CONNECTION CODEX MODEM AND ACTIVATION:

Before traveling to an ASOS site:

- a. Sites listed in **Appendix B** contains **external codex modems**.
- b. Contact Jerry Kranz prior to going to the ASOS site.
- c. Sites listed in Appendix B that require installation of an SIO card are indicated by a check mark (J). Remotely access the ASOS and verify that an SIO port is available to be assigned to the codex modem (ADAS). Two consecutive ports on a single SIO card must be available. Ports 1 and 2 or Ports 3 and 4 are the only allowable configurations. If the ports are not available, an additional SIO board (XVME-49011) will be required and installed. Contact Bobby McCormick to obtain an SIO board.

2.0 INSTALLATION STEPS FOR EXTERNAL CONNECTION AND ACTIVATION.

Once at a site, complete the following:

- a. If required, install the additional SIO board according to the site technical manual.
- b. Access the ACU I/O panel assembly and disconnect any cable that may be connected to the inner DB-25 connector at I/O panel location J29 (this cable was most likely connected to an RS-422 port on SIO board #1). Cover the SIO board #1 cable connector with foam or another nonconductive substance and store inside the ACU.
- c. Locate the cable from the RS-232 SIO port to be used for the ADAS interface and connect to the inner DB-25 connector at location J29. The cable should be run with existing cables down the interior of the ACU cabinet to the I/O panel and connected to the EMI filter/surge suppressor.
- d. The ASOS SIO port which communicates with the codex modem must be configured properly and enabled. Ensure that the SIO port configuration, obtained from the ASOS COMMS configuration page, reflects the following:

FUNCTION	ADAS	HANDSHAKE	SYNCHRONOUS
STATUS	ENABLED	CONNECTION	HARD-WIRE
BAUD RATE	2400		
PARITY SELECT	NONE		
BITS/CHAR	8		
STOP BITS	1		

- e. The "ASOS ADDRESS" field on the ASOS EXTERNAL COMMUNICATIONS page (REVUE-SITE-CONFIG-EXTRN) will need to contain the ASOS polling address as assigned by the ADAS. This parameter can be entered by the ASOS technician if it is available or it can be entered by the AOMC when it becomes available. By default the address is 100, which is an invalid ADAS address. Valid addresses are odd numbers from 03 to 21.

This completes the external codex modem connection/activation procedure.

Appendix A

Sites requiring connection to INTERNAL Codex modem

	SID	LOCATION	ST	NEEDING SIO CARD
1	BPK	Mountain Home	A R	
2	DEQ	De Queen	A R	
3	HKA	Blytheville	A R	
4	HOT	Hot Springs	A R	
5	HRO	Harrison	A R	
6	JBR	Jonesboro	A R	
7	LLQ	Monticello	A R	✓
8	PBF	Pine Bluff	A R	
9	RUE	Russellville	A R	
10	OLS	Nogales	A Z	
11	SJN	St. Johns	A Z	
12	ACV	Arcata	C A	
13	BLH	Blythe	C A	
14	L32	Oceanside	C A	
15	O18	Hanford	C A	
16	STS	Santa Rosa	C A	
17	WVI	Watsonville	C A	✓
18	MMK	Meriden	C A	
19	GED	Georgetown	D E	
20	ABY	Albany	G A	
21	AMG	Alma	G A	
22	VPC	Cartersville	GA	
23	3SM	Shelbyville	IN	
24	VPZ	Valparaiso	IN	
25	6RO	Slidell	LA	
26	HUL	Hulton	ME	
27	ADG	Adrian	MI	
28	CMX	Hancock	MI	
29	RWF	Redwood Falls	MN	
30	HBG	Hattiesburg	MS	
31	HKS	Jackson	MS	✓
32	AKH	Gastonia	NC	
33	BUY	Burlington	NC	
34	EQY	Monroe	NC	
35	LYI	Lumberton	NC	
36	MRH	Beauford	NC	
37	CDR	Chadron	NE	
38	6B1	Rochester	NH	

	SID	LOCATION	S T	NEEDING SIO CARD
39	FWN	Sussex	NJ	
40	MEB	Maxton	NJ	
41	N52	Somerville	NJ	
42	VAY	Mt. Holly	NJ	
43	DMN	Deming	NM	
44	GUP	Gallup	NM	
45	TCC	Tucumcari	NM	
4 6	LOL	Lovelock	NV	
47	TPH	Tonopah	NV	
48	ART	Watertown	NY	
49	DSV	Danville	NY	
50	FOK	Westhampton Beach	NY	
51	PLB	Plattsburgh	NY	
52	2I8	Newark	OH	
53	AOH	Lima	OH	
54	DFI	Defiance	OH	
55	MGY	Dayton	OH	
56	MNN	Marion	OH	
57	TDZ	Toledo	OH	
58	S22	Hermiston	OR	
59	JST	Johnstown	PA	
60	MPO	Mt. Ponoco	PA	
61	N88	Doylestown	PA	
62	N97	Clearfield	PA	
63	SEG	Selinsgrove	PA	
64	29J	Rock Hill	SC	
65	CEU	Clemson	SC	
66	FLO	Florence	SC	
67	GRD	Greenwood	SC	
68	CSV	Crossville	TN	
69	ALI	Alice	TX	
70	F54	Arlington	TN	
71	INK	Wink	TX	
72	MWL	Mineral Wells	TX	
73	T31	Port Isabel	TX	
74	TKI	McKinney	TX	
75	BCE	Bryce Canyon	UT	
76	CNY	Moab	UT	
77	LGU	Logan	UT	
78	PUC	Price	UT	
79	VEL	Vernal	UT	

Appendix B

Sites requiring connection to EXTERNAL Codex modem

	SID	LOCATION	ST	NEEDING SIO CARD
1	ANB	Anniston	AL	
2	DHN	Dothan	AL	✓
3	TCL	Tuscaloosa	AL	✓
4	ELD	El Dorado	AR	
5	LIT	Little Rock	AR	✓
6	DVT	Phoenix	AZ	
7	PRC	Prescott	AZ	
8	SDL	Scottsdale	AZ	
9	APC	Napa	CA	✓
10	AVX	Avalon	CA	
11	BUR	Burbank	CA	
12	CNO	Chino	CA	
13	CRQ	Carlsbad	CA	
14	DAG	Daggett	CA	
15	FUL	Fullerton	CA	
16	HHR	Hawthorne	CA	
17	HWD	Hayward	CA	✓
18	IPL	Imperial	CA	
19	LVK	Livermore	CA	
20	MAE	Madera	CA	✓
21	MOD	Modesto	CA	
22	MRY	Monterey	CA	
23	MYF	San Diego	CA	
24	MYV	Marysville	CA	
25	O45	Vacaville	CA	
26	OAK	Oakland	CA	
27	ONT	Ontario	CA	
28	OVE	Oroville	CA	✓
29	OXR	Oxnard	CA	
30	PMD	Palmdale	CA	
31	PRB	Paso Robles	CA	
32	PSP	Palm Springs	CA	
33	RAL	Riverside	CA	
34	SAC	Sacramento	CA	
35	SBA	Santa Barbara	CA	✓
36	SBP	San Luis-Obispo	CA	
37	SJC	San Jose	CA	✓
38	SMF	Sacramento	CA	
39	SMO	Santa Monica	CA	

	SID	LOCATION	ST	NEEDING SIO CARD
80	5B5	Bennington	VT	
81	ELN	Ellensburg	WA	
82	FHR	Friday Harbor	WA	
83	ASX	Ashland	WI	
84	AUW	Wausau	WI	
85	LNR	Lone Rock	WI	
86	OVS	Boscobel	WI	
87	BPI	Big Piney	WY	
88	BYG	Buffalo	WY	
89	DGW	Douglas	WY	
90	EVW	Evanston	WY	✓
91	GEY	Greybull	WY	
92	LAR	Laramie	WY	
93	TOR	Torrington	WY	
94	WRL	Worland	WY	

	SID	LOCATION	ST	NEEDING SIO CARD
40	SNA	Santa Ana	CA	
41	SNS	Salinas	CA	
42	TRM	Thermal	CA	
43	TVL	South Lake Tahoe	CA	
44	VNY	Van Nuys	CA	
45	APA	Denver	CO	
46	ASE	Aspen	CO	
47	DXR	Danbury	CT	
48	GON	Groton	CT	
49	HVN	New Haven	CT	
50	FLL	Ft. Lauderdale	FL	
51	FMY	Fort Myers	FL	
52	FPR	Fort Pierce	FL	
53	FXE	Ft. Lauderdale	FL	
54	HWO	Hollywood	FL	
55	MLB	Melbourne	FL	
56	OPF	Miami	FL	
57	ORL	Orlando	FL	
58	PFN	Panama City	FL	
59	PIE	St. Petersburg	FL	
60	PMP	Pompano Beach	FL	
61	RSW	Fort Myers	FL	
62	SPG	St. Petersburg	FL	
63	SRQ	Sarasota	FL	
64	TMB	Miami	FL	
65	VRB	Vero Beach	FL	✓
66	FTY	Atlanta	GA	✓
67	GNV	Gainesville	GA	
68	PDK	Atlanta	GA	
69	SSI	Brunswick	GA	
70	MCW	Mason City	IA	
71	OTM	Ottumwa	IA	
72	BYI	Burley	ID	
73	U11	Rexburg	ID	✓
74	ARR	Aurora	IL	
75	DEC	Decatur	IL	
76	LAF	Lafayette	IN	✓
77	LOU	Louisville	KY	✓
78	LFT	Lafayette	LA	✓
79	MLU	Monroe	LA	✓
80	NEW	New Orleans	LA	
81	BAF	Westfield	MA	

	SID	LOCATION	ST	NEEDING SIO CARD
82	BED	Bedford	MA	
83	PSF	Pittsfield	MA	
84	HGR	Hagerstown	MD	
85	N80	Ocean City	MD	✓
86	SBY	Salisbury	MD	
87	AUG	Augusta	ME	
88	BGR	Bangor	ME	
89	BVY	Beverly	ME	
90	ARB	Ann Arbor	MI	
91	AZO	Kalamazoo	MI	
92	BTL	Battle Creek	MI	
93	DET	Detroit	MI	✓
94	MBS	Saginaw	MI	
95	PTK	Pontiac	MI	
96	TVC	Traverse City	MI	
97	YIP	Ypsilanti	MI	
98	FCM	Minneapolis	MN	
99	MKC	Kansas City	MO	
100	SUS	St. Louis	MO	
101	GLH	Greenville	MS	
102	ECG	Elizabeth City	NC	
103	FAY	Fayetteville	NC	
104	HKY	Hickory	NC	
105	IGX	Chapell Hill	NC	
106	INT	Winston Salem	NC	
107	RWI	Rocky Mount	NC	
108	RZZ	Roanoke Rapids	NC	
109	DIK	Dickenson	ND	
110	GFK	Grand Forks	ND	
111	JMS	Jamestown	ND	
112	MOT	Minot	ND	
113	LEB	Lebanon	NH	
114	MHT	Manchester	NH	
115	CDW	Caldwell	NJ	
116	TTN	Trenton	NJ	
117	CNM	Carlsbad	NM	
118	SAF	Santa Fe	NM	
119	EKO	Elko	NV	
120	ELM	Elmira	NY	
121	ELZ	Wellsville	NY	
122	FRG	Farmingdale	NY	
123	GFL	Glen Falls	NY	

	SID	LOCATION	ST	NEEDING SIO CARD
124	HPN	White Plains	NY	
125	HWV	Shirley	NY	
126	IAG	Niagara Falls	NY	✓
127	ISP	Islip	NY	
128	MIV	Millville	NY	
129	MSS	Massena	NY	
130	POU	Poughkeepsie	NY	
131	PTW	Pottstown	NY	
132	SLK	Saranac Lake	NY	✓
133	UCA	Utica	NY	✓
134	AKR	Akron	OH	
135	BKL	Cleveland	OH	
136	OSU	Columbus	OH	
137	ZZV	Zanesville	OH	
138	1S4	Scappose	OR	
139	BKE	Baker	OR	
140	DLS	The Dalles	OR	
141	HIO	Portland	OR	
142	LMT	Klamath Falls	OR	✓
143	TTD	Portland	OR	
144	AGC	Pittsburgh	PA	
145	AOO	Altoona	PA	
146	CXY	Harrisburg	PA	
147	LNS	Lancaster	PA	
148	MDT	Harrisburg	PA	
149	RDG	Reading	PA	
150	WST	Westerly	RI	
151	AND	Anderson	SC	
152	CRE	North Myrtle Beach	SC	
153	GMU	Greenville	SC	
154	CKV	Clarksville	TN	
155	MEM	Memphis	TN	
156	AFW	Ft. Worth	TX	
157	ARA	New Iberia	TX	
158	DAL	Dallas	TX	
159	DHT	Dalhart	TX	
160	DWH	Houston	TX	
161	FTW	Ft. Worth	TX	
162	GGG	Longview	TX	
163	HOU	Houston	TX	
164	LBX	Angerton/Port Jackson	TX	
165	LFK	Lufkin	TX	

	SID	LOCATION	ST	NEEDING SIO CARD
166	MCB	McComb	TX	
167	RBD	Dallas	TX	
168	SSF	San Antonio	TX	
169	TYR	Tyler	TX	
170	CDC	Cedar City	UT	
171	OGD	Ogden	UT	
172	CHO	Charlottesville	VA	
173	PHF	Newport News	VA	
174	07S	Deer Park	WA	✓
175	ALW	Walla Walla	WA	
176	BFI	Seattle	WA	
177	BLI	Bellingham	WA	
178	EPH	Ephrata	WA	
179	HQM	Hoquiam	WA	
180	PAE	Everett	WA	
181	PSC	Pasco	WA	
182	PUW	Pullman	WA	✓
183	RNT	Renton	WA	
184	SFF	Spokane	WA	✓
185	LSE	Lacrosse	WI	
186	CKB	Clarksburg		
187	HLG	Wheeling		
188	MGW	Morgantown		
189	MRB	Martinsburg		

WS HQ USE ONLY		WS FORM A-26 (4/94) Supersedes WS Form A-2 and WS Form H-28 which are obsolete				U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE				Document Number G 49978			
ENGINEERING MANAGEMENT REPORTING SYSTEM MAINTENANCE RECORD													
General Information		1. Open Date		Time		2. Initials		3. Response Priority (check one)			4. Close Date		
		05 / 20 / 97		0900		M R B		<input type="radio"/> Immediate <input type="radio"/> Low <input type="radio"/> Routine <input type="radio"/> Not Applicable			05 / 20 / 97 1130		
5. Description													
PERFORM MODIFICATION TO THE ACOMM I.A.W. MOD NOTE 45													
Equipment Information		6. Station ID		7. Equipment Code		8. Serial Number		9. TM		10. AT		11. How Mal.	
		MDT		ACOMM		001		M		M		999	
12. EQUIPMENT OPERATIONAL STATUS TIMES		a. Fully Operational		b. Logistics Delay		c. Partly Operational		d. Logistics Delay		e. Not Operational		f. All Other	
												2:30	
13. Parts Failure Information										14. Work Load Information			
Block #	a. ASN	b. NSN	c. TM	d. AT	e. How Mal.	f. Qty.	g. Maint. Hrs.	Type	Staff Hrs.				
1								a. Routine					
2								b. Non-routine					
3								c. Travel					
4								d. Misc.	02:30				
5								e. Overtime					
Miscellaneous Information		15. Maintenance Comments										16. Initials	
		COMPLETED THE CONNECTION OF ASOS TO THE FAA COMMUNICATION NETWORK USING CODEX MODEMS										MRB	
17. SPECIAL PURPOSE REPORTING		a. Mod. No.		b. Mod./Act./Deact. Date		c.		d.		e.			
		45		05/20/97									
18. CONFIGURATION MGMT. REPORTING (use as directed)		a. Block#		b. Manufacturer's Part No. of New Part						c. Revision No. of New Part			

ASOS ERRATA SHEET 1 (for Electronics Technicians)

Engineering Division

W/OS0321: WW

Errata Sheet 1 to Automated Surface Observing System (ASOS) Modification Note 45.

General :

Errata Sheet 1 provides an additional two lines of instruction on page 4 under the section Reporting Modification.

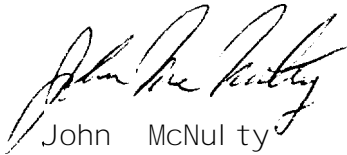
Procedure:

Pen and ink the following in the Reporting Modification section (page 4):

In Block 8, of Form A-26, enter the serial number of the ACU. And in Block 18, of Form A-26, enter the ASN and S/N of the SIO board and modem (if installed).

Effects on Other Instructions:

None



John McNulty
Chief, Engineering Division